The IRON AGE

October 31, 1957 A Chilton Publication The National Metalworking Weekly

Republic Steel's Sandmaier:

Sales Forecasting: Can It Work For Smaller Firms? P. 21

ALLOY 815-R: A new iron-chromium-aluminum alloy developed especially for use on precision resistor applications. Possesses high resistivity and low temperature coefficient of resistance, plus high strength, excellent ductility, and stability over a wide temperature range.

CHROMEL-C: A 60-16 nickel-chromium-iron alloy widely used in small heating appliances and cold resistors where high resistances are required within limited space. Its stability and uniformity minimize design variables, permit more efficient production of better units at lower cost.

CHROMEL-ALUMEL: The most accurate and most durable base metal thermocouple alloys ever developed. Made exclusively by Hoskins, they are the accepted standards for controlling heat treating operations up to 2300°F. and for measuring temperatures of jet aircraft engines.

ALLOY 46: A gas-free nickel-iron alloy developed especially for use as a terminal material for power resistor units. It is readily "wetted" by enamel to produce a good bond, and its coefficient of expansion is very similar to that of enamels used for such applications.

CHROMEL-D: A time proven low nickel heating element alloy for controlled atmosphere furnace applications. Highly resistant to sulphur attack and preferential intergranular oxidation, it gives long-life service in the critical temperature range between 1500° and 1800°F.

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When it comes to developing and producing custom quality alloys for electrical resistance, thermo-electric, and specialized mechanical purpose applications, you'll find that Hoskins has what it takes to meet your most critical requirements. Complete metallurgical research and development facilities, for one thing. Modern melting and processing equipment, for another. More important, though, is an abundance of human talent . . . people who have the experience, the know-how, and a sincere desire to deliver exactly what you want when and where you want it. *Try them and see!*

Life in a Vacuum—The special vacuum atmosphere life-test equipment shown above was designed and built by Hoskins for use in developing new heating element alloys which will give improved performance and dependable, long-life service in vacuum atmosphere heat treating equipment.

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Will help create new stores of power in Pacific Northwest

This huge forged shaft is one of eight produced by Bethlehem for the generating equipment at The Dalles Dam, on the Columbia River. When finally installed, it will have a part in the vast system of power production now under development in the Pacific Northwest.

Of carbon-vanadium steel, the shaft weighs approximately 190,000 lb; is more than 33 ft long, and has a maximum diameter of 96½ in. Its smallest body diameter is slightly over 38 in. Running the entire length of the shaft is a uniform 15½-in. bore.

Forgings of this size are spectacular, and months of painstaking work go into their planning and manufacture. It's a type of assignment that Bethlehem has been handling for many years. But the big "show pieces" are only a fraction of Bethlehem's output. We are equipped to make and machine any kind of forging ever needed—from giant cylinders, shafts, and columns to midgets weighing a pound or less.

You are invited to check with us when next in the market for press, hammer, drop, or upsetter forgings. Inquiries are welcome, always. Whether your needs are large or small, our engineers will cooperate fully.

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THE IRON AGE
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The IRON AGE

October 31, 1957—Vol. 180, No. 18

Digest of the Week in

*Starred items are digested at right.

NEWS ARTICLES

FAR NORTH

Inco's Project—Opening new rail spur is a milestone to wilderness

nickel project. This report traces progress of operation that will yield 75 million lb of nickel annually.
P. 26

ALUMINUM CANS

Reynolds' Side — Company executive tells in exclusive interview how Reynolds Metals expects to show a profit on controversial Esso contract. Salvage of used cans is key to situation. P. 24

STOCKPILE CHANGES

They're a Good Bet—Review of U. S. mobilization stockpiling program will get attention of special citizens committee. They may recommend that metals and minerals not now stored be included in the plan. P. 28

AUTO UNIT BODIES

Do Better Job for Lincoln—The all-welded unitized body that Lincoln switched to this year has a

Metalworking

SALES FORECASTING: P. J. Sandmaier, manager, Commercial Research Div., Republic Steel Corp., tells how a sales forecast can serve far more than its primary purpose. It can be a useful tool in guiding production, purchasing and distribution. P. 21

number of production advantages. Welding on precision jigs makes fitting of doors, hoods, deck lids easier in final assembly. P. 36

CUTBACKS IN SEATTLE

Defense Reductions Hurt—Boeing—Seattle area's largest employer—is laying off non-production personnel, reducing hiring and screening all new purchases. P. 43

FEATURE ARTICLES

NEW TITANIUM USES

Clad on Carbon Steel—Titanium-clad steel is a practical reality. It's a way to get the benefits of titanium without the high cost of the solid metal. A low-cost plate forms the bond between the nonstructural layer and the strength-giving carbon steel. P. 59

OPTICAL TOOLING

For Accurate Alignment — Precision telescopes provide a sagless reference line over long distances. Days of tedious layout can be reduced to hours. It's a short-cut to getting things straight, accurately leveled, and precisely square. Measurements to within a few thousandths are possible over distances of 100 ft or more. P. 63

DESULPHURIZATION

With Powdered Lime—By blowing pig iron with lime powder, sulphur content is reduced to a very low level. The process, a French development, is exceptional because it combines efficiency with practicality. P. 66

NEW MAGNETIC STEEL

Magnetizes Four Ways — It's a silicon-iron sheet with a cube-oriented metallurgical structure. The new steel requires less energy to achieve magnetization. Its electrical properties are ideal for use in transformers, motors, and many other electrical devices. P. 68

MECHANIZED SCREWDRIVER

For Socket Set Screws—Since a socket set screw has no head, it takes a special unit to detect the socket end and face the screw in the right direction. Here's one that does the job faster than screws can be driven. P. 70

MARKETS & PRICES

FOUNDRY CLAUSES

Get Closer Attention — Rising costs are interesting founders in closer look at clauses giving customers 90 days to return defective castings. They'd like to strictly enforce time limit. P. 28

DEFENSE INVENTORIES

Who'll Maintain Them? — Defense planners are worried about high costs of maintaining military stocks and danger of them becoming obsolete. They may sell existing supplies. P. 41

TAPE CONTROLS

For Short Runs—Job shop operators can look forward to numerically controlled machine tools that they can use economically. Kaukauna Machine & Foundry has unveiled a tape control system for its equipment. P. 45

STEEL OUTLOOK

Some Catching Up—Mills have some catching up to do to attain earlier predictions on 1957 output. Best bet: 1957 will be industry's third best year. P. 95

ADHESIVES SALES

In the Middle of a Boom—Cost advantages and versatility are winning new users for industrial adhesives. Metal bonding with them has reached point where it competes with mechanical and fusion methods for structural joining. P. 96

NEXT WEEK

MISSILE HARDWARE

Can You Machine It?—There's a lot of this work to be done right now. Just what are the opportunities? What talents and equipment are needed? Next week's feature brings the answers from one of the pioneers in this field.

Smooth I. D. Tubing Simplifies Production of Hydraulic Cylinders

Machining and fabricating operations can be reduced or eliminated if tubing used in hydraulic cylinders has as near perfect a surface and as close size tolerances as commercially possible. To achieve these desired qualities, checking and rechecking are integral parts of the tube making operations.

For checking the tolerances of the special smooth I.D. of welded carbon steel mechanical tubing which is to be used for hydraulic cylinders, Walter Pilmer —one of the inspection crew at B&W's Alliance, Ohio, plant—is using a sensitive precision measuring instrument called a bore gage. This is only one of the many checks of the tube production cycle.

Years of experience and the most advanced equipment available anywhere result in B&W "special smooth I.D." mechanical tubing. This tubing is provided with a guaranteed maximum average micro-inch finish on the I.D. which makes it ready for use in many hydraulic systems on delivery. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pa.

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New facts on inventory costs revealed by IRON AGE survey

ning program: A steel pin is ... Inventory carrying ... age inventory x fixed cost of 15

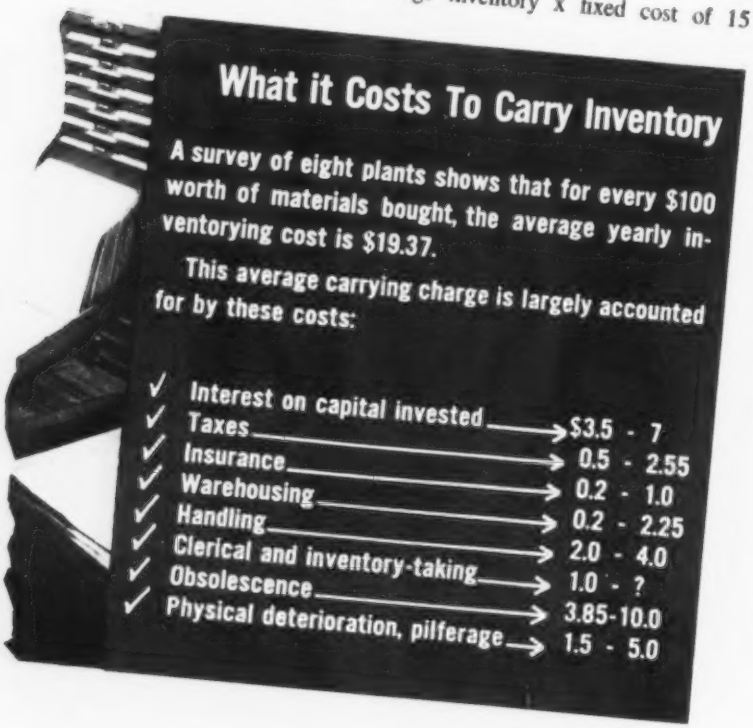

Chart courtesy The Iron Age.

Here's help on steel inventory costs . . .
In these days when working capital is tight and interest rates are high, it's especially important not to let inventory take dollars you can use elsewhere. You can save money on steel inventory costs by letting Ryerson carry the inventory for you. It's already here, at Ryerson—in the nation's largest stocks of steel. And Ryerson has the organization to deliver what you want when you want it. For immediate steel service, call the Ryerson plant near you.

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Business As Usual? Hardly, for Quite Some Time!

Some of us may have gone back to sleep feeling that words and press releases have answered the challenge of Sputnik. Maybe it isn't generally known that the world is changing and our thinking hasn't!

We seem to feel confident because the Russians don't have a high standard of living. Because we have washing machines, radar cooking, dishwashers, electric eye garage door openers and ice cream at every meal, we believe that puts the Reds behind us in everything else.

We also take comfort in the worn-out idea that one day the Russian masses will rise up and crush their masters. Maybe they will, but maybe we won't be around to celebrate.

For some reason our thinking about ultimate survival is mixed up with our ideas of consumer strength, demand, and attitudes. Military strength we still have, but whether it is as great as Russia's is now open to serious question.

Strength carries the power to destroy or the power to keep from being destroyed. If we are to have the power to keep from being destroyed, it must be stronger than Russia's power to destroy us.

The Russian scientists and engineers have a high standard of living. They have pretty much what they want. They have the best in laboratories and materials. They are let alone to meet the challenges of pure and applied research—after they are put on the track of missiles, space, and world-control projects.

Russian scientists are adulated and are big wheels in their country. Most, if not all of them, are firm believers in the Communist dogma. Their nation's gigantic success in getting ahead of us in space satellites and probably in rocket research and performance will spur them to further deeds.

We can't fight this cold war—or the horrible hot one if it comes—with soap operas, golf, bowling, or LP records. They are pleasant parts of graceful living but they aren't the answer to Sputnik and survival.

Quickly, we need an honest and forthright re-appraisal of our defense effort. Leadership, strength, and admission of errors are necessary. We can't have business as usual as long as the Russians have in their hands the means of world domination.

To continue to delude ourselves with dangerous wishful thinking is rank unmitigated idiocy.

Tom Campbell

Editor-in-Chief

A new line of Standard Oil greases

RYKON

GREASE

Major breakthrough in grease technology results in development of new thickening agent. New grease has greater high temperature stability, superior multi-purpose qualities, improved lubricating properties.

Standard Oil instituted a grease research and development project several years ago. The result of this work is the line of RYKON Greases, which contain a unique new non-soap, organic thickening agent.

RYKON Greases surpass in stability and performance the best greases made up to this time. They bring to industry new opportunities for improved machine performance. They greatly reduce the maintenance and grease handling problems encountered in industry.

RYKON Grease properties

RYKON Greases are smooth, buttery-textured greases, made from the finest quality, solvent-extracted oil. Their thickening agent is a Standard Oil exclusive. RYKON Greases have these high-quality characteristics:

High temperature stability—Better heat stability than any other petroleum oil grease. ASTM dropping point of 480°F. Maintain consistency in service at high temperatures.

Mechanically stable—Maintain consistency even under severe mechanical working in service.

Chemically stable—Inhibit oxidation. Oil and thickening agent in combination possess extremely good chemical stability.

Wide temperature range—Lubricate at high and low temperatures. Extended range of application thus obtained makes RYKON Greases truly multi-purpose.

Water resistance—Do not lose consistency in presence of water. Highly resistant to water washout.

Oil separation—Minimum bleeding of oil in service and storage.

Anti-rusting—Exceptional natural rust preventive characteristics.

With RYKON Greases, lubrication can become simple, foolproof and less expensive—much less expensive, perhaps, than a single shut down caused by equipment failure due to the use of the wrong type of grease or the use of an "economy" grease lubricant.

RYKON Greases come in four Regular and three Heavy-Duty grades. Thus there is a RYKON Grease to take care of every grease lubrication job. Using RYKON Greases plant-wide can reduce your grease storage requirements, simplify lubrication maintenance training, cut down record keeping, save on dispensing equipment and reduce investment in grease inventories.

Get more facts about RYKON Greases. Call your nearby Standard Oil industrial lubrication specialist in any of the 15 Midwest or Rocky Mountain states. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

Check Chart Of RYKON Greases

Regular Line	Grade Consistency
RYKON Grease No. 0	0
RYKON Grease No. 1	1
RYKON Grease No. 2	2
RYKON Grease No. 3	3
Heavy Duty Line	
RYKON Grease No. 0 E. P.	0
RYKON Grease No. 1 E. P.	1
RYKON Grease No. 2 E. P.	2

STANDARD

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LETTERS FROM READERS

Cold War

Sir—Your editorial in IRON AGE, Oct. 10th, 1957, "Alibis Are No Excuse, We Are Losing the Cold War," is certainly tops. I wish it could be read by every person in the United States who seriously has the welfare of our country at heart.

It is hard to realize that those higher up in the government charged with the peace and security of our country, can quite complacently offer such weak excuses as to why we are always missing the boat.—W. R. Ferguson, Purchasing Agent, The Barden Corp., Danbury, Conn.

Pull Up Your Socks

Sir — Your editorial, "Pull Up Your Socks, It May Get a Little Sloppy!" is really a dandy. I have just sent a copy to all of our salesmen.

It is the type of philosophy that we have been preaching for years. —D. T. Marvel, Vice Pres. for Sales, Olin Mathieson Chemical Corp., Western Brass Mills Div., East Alton, Ill.

Sir — I have read with great interest the editorial, "Pull Up Your Socks, It May Get a Little Sloppy!". I feel that this was an excellently written article and voices the feelings of sales managers throughout the country.—M. J. Grober, Victor Electric Wire & Cable Corp., West Warwick, R. I.

Sir—Your editorial in the Oct. 3 issue is most certainly to the point and I would like to distribute it to our sales people.—J. F. Lott, Pres., Fort Duquesne Steel Co., Pittsburgh.

Sir—The editorial in your Oct. 3 issue represents, we think, the most telling statement in sales potential analysis. Congratulations and many thanks to you for the opportunity to have read it.—J. E. Cambria, Vice Pres. & Gen. Mgr., Brockway Motor Trucks, Div. of Mack Trucks, Inc., Cortland, N. Y.

Defense Sinews

Sir—I have just finished reading your Sept. 26 issue. I was happy to read, in your editorial, that "When all the smoke clears there will be no basic weakening in the sinews of our defense."

However, I am having a little trouble correlating your editorial with the article on p. 79 which says that:

1. Military manpower will be cut by 200,000 men.
2. The Air Force will lose five (5) wings.
3. The Army will lose four (4) divisions.
4. The Navy will lose thirty (30) vessels.
5. Missile projects will be combined for "economy."
6. The replacement of obsolescent aircraft with F-101's, F-104's and F-105's will be delayed.—H. J. Lander, Wakefield, Mass.

▪ Perhaps No. 5 will now be "re-examined."—Ed.

"We have one of the oldest sick benefits in business . . . a shot of brandy and aspirin."

The range that loves it at the seashore

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From this device at the Tinnerman laboratories have come scores of protective finishes for any type of exposure—road salt under automobiles, corrosive fumes around industrial electronic devices, detergents in home-laundry equipment, and others.

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FATIGUE CRACKS

The Far North

Although Editor George Sullivan spends a great deal of his time traveling across the North American continent, he seldom gets too far away from the comforts of plumbing and steam heat.

That may be one of the reasons why he captured the frontier spirit when he journeyed far into northern Manitoba for the important opening of a railroad spur to International Nickel's new Canadian operation.

A spot news report on the significance and extent of the operation was filed from the scene. (IRON AGE, Oct. 24, p. 300).

Giant Project — But when the editor returned to the comparatively mild latitudes of Philadelphia, and shook the muskeg from his rubbers, he continued to be fascinated by the problems of carving a vast industrial operation out of a northern forest. Problems that are not only physical, but sociological as well.

So he put down on paper some of his observations and reflections on the giant project, with more background, data, maps and pictures. If you'll turn to p. 26, you will find a fascinating story of this modern conquering of the wilderness, all to make more nickel available for metalworking.

Index to Prices

We yield to no one in touting our Markets and Prices section as the best in the business. You can find just about anything of importance to metalworking's markets and prices there, while it's news and not common knowledge around the industry.

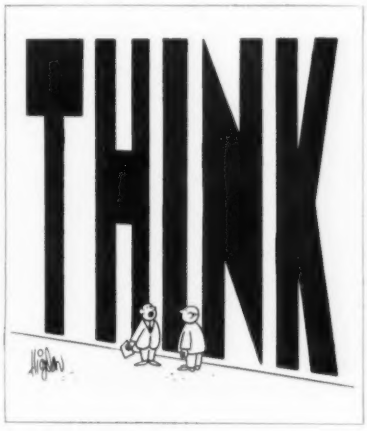
To make it a little easier to put your finger on the price and markets information you want, we have been including an Index to Price Pages within the Markets and Prices section.

Where To Look—You will find it this week, and every week, on the Comparison of Prices page, p. 99 of this issue.

New Puzzler

There was a vacancy in the department of philosophy in a large university. The head of the department brought together three well-known logicians, A, B, and C, who had applied for the position, to select one to fill the vacancy.

Finding them all qualified, and unable to make a selection, he gave them a final test. He blindfolded them, telling them that he had some



"Don't you think we're overdoing this a little."

soot on a finger. He said, "I will rub a finger over the forehead of each of you. I may leave a smudge on one, two or three of you, or perhaps no one. When the blindfolds are removed I want you to give one tap on the floor if you see either one or two smudges. And I want to know which one of you knows that he himself is marked."

The blindfolds were applied, the professor left a smudge on each of the three foreheads.

Immediately the bandages were removed all three men tapped. After a few moments of silence, Mr. A announced, "I know that I am marked." How did he know?

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call KE for plant expansion or new facilities

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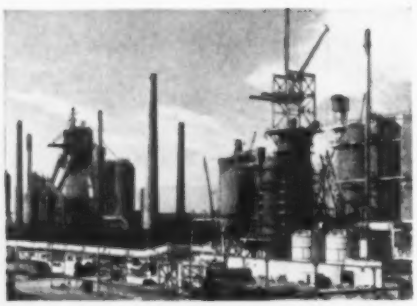

At India's mammoth Tata works, at Jones & Laughlin, at Kaiser Steel—Kaiser Engineers' ingenuity advances the art of making steel.

KE can take your development thoughts from a gleam in your eye through start-up. KE performs any part—economic analysis, plant location, engineering, design, procurement, expediting, construction. One contract can cover all.

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EXHIBITS, MEETINGS

Metal Show — Nov. 2-8, Chicago Int'l Amphitheatre. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

Eighth National Plastics Exposition —Nov. 17-21, International Amphitheatre, Chicago. (Society of the Plastics Industry, 250 Park Ave., N. Y. 17.)

Exposition of Chemical Industries —Dec. 2-6, New York Coliseum. (International Exposition Co., 480 Lexington Ave., N. Y. 17.)

Third Annual National Construction Industry Conference on Creative Trends in Structural Design— Dec. 4-5, Congress Hotel, Chicago. (Armour Research Foundation of Illinois Institute of Technology, 10 W. 35th St., Chicago 16.)

NOVEMBER

Metal Treating Institute — Annual meeting, Nov. 1-3, Sheraton Hotel, Chicago. Society headquarters, 271 North Ave., New Rochelle, N. Y.

The Society for Nondestructive Testing—Second international conference on nondestructive testing, Nov. 3-8, Morrison Hotel, Chicago. Society headquarters, 1109 Hinman Ave., Evanston, Ill.

Wire Reinforcement Institute—Annual fall meeting, Nov. 4-5, Safari Hotel, Scottsdale (Phoenix) Ariz. Society headquarters, National Press Bldg., Washington, D. C.

American Institute of Electrical Engineers — Annual machine tool conference, Nov. 4-6, Hotel Schroeder, Milwaukee. Society headquarters, 33 W. 39th St., New York.

Investment Casting Institute—Meeting, Nov. 5-7, Cleveland. Institute headquarters, 27 E. Monroe St., Chicago.

Grinding Wheel Institute — Fall semi-annual meeting, Nov. 6-8, The Sheraton-Blackstone Hotel,

(Continued on P. 16)

the modern bee uses

CF&I-WICKWIRE WIRE!

Modern bees have stopped storing honey in handy hollow trees. Instead, they choose man-made hives—hives which are neatly divided by wood and special round, tinned, hard drawn, low carbon CF&I-Wickwire Bee Wire.

Chances are you don't need wire to make bee hives. But *you may need one or more of the nearly 100 different categories of specialty wire for which CF&I-Wickwire is famous.* Let us show you how we can meet your most rigid chemical and physical specifications on high and low carbon wire in all sizes, shapes, tempers, finishes and grades.

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Bobby Pin Wire
Bookbinder Wire
Brush Wire
Casing Wire
Cotter Pin Wire
Curtain Spring Wire
Die Spring Wire
Gutter Broom Wire
Lock Spring Steel
Rake Tine Steel
Regulator Spring Wire
Snake Fishing Steel
Stapling Wire for Preformed Staples (Flat)

LOW CARBON FINE AND SPECIALTY WIRE
Bee Wire
Bonnet Wire
Bookbinder Wire
Broom Wire
Clip Wire
Dent Spacer Wire
Drapery Pin Wire
Florist Wire
Fuse Wire
Glass Netting Wire
Hairpin Wire
Hook and Eye Wire
Mattress Wire
Picture Cord Wire
Picker Tooth Wire
Pin Ticket Wire
Pin Wire
Ring Traveller Wire
Spiral Binding Wire
Stapling Wire
Stapling Wire for Preformed Staples
Stone Wire
Weaving Wire
Weaving Wire for Fly Screen Cloth
Wissco Iron Wire

HIGH CARBON FINE AND SPECIALTY WIRE
Aircraft Cord Wire
Armor Wire
Belt Hook Wire
Bobbin Ring Wire
Brush Wire (Tempered and Untempered)
Brush Wire (High Strain)
Chrome Vanadium Spring Wire
Core Wire (Aluminum Cable Steel Reinforced)
Curtain Spring Wire
Flexible Shaft Wire
"Gamma" Spring Wire (Upholstery Spring Wire)
Zig Zag Wire
No-Sag Wire
Hat Wire
Heddle Wire
Hose Reinforcement Wire
Hose Wire, Mechanical
Hose Wire, Vacuum and Defroster
Rope Wire
Signal Corps Wire
Spoke Wire
Hard Drawn Spring Wire
Oil Tempered Wire
Spheroidized or Annealed Spring Wire
Tire Bead Wire
Valve Spring Wire

MANUFACTURERS LOW CARBON COARSE WIRE
Bag Tie Wire
Basket Handle Wire
Box Binding Wire
Brush Handle Wire
"Cal-Tie" Wire
Can Key Wire
Case Hardened Ball Wire
Chain Wire
Clamp Wire
Clothes Pin Wire
Concrete Wall Reinforcement Wire
Garment Hanger Wire
Hay Baling Wire (Coiled)
Lingo Wire
Lintel Wire
Loop Wire
Merchant Quality Wire
Pail Bail Wire
Rivet Wire
Stapling Wire
Strand Wire
Tying Wire
Welding Wire
Wissco Iron Wire
Industrial Quality Wire
Cold Rolling Quality Wire
Heading, Forging or Roll Threading Quality Wire
Medium High Carbon Wire

CF&I-WICKWIRE WIRE

THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Casper Denver • El Paso • Ft. Worth • Houston • Kansas City • Lincoln (Neb.) • Oklahoma City • Phoenix Pueblo • Salt Lake City • Wichita • PACIFIC COAST DIVISION—Los Angeles • Oakland • Portland San Francisco • Seattle • Spokane • WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago Detroit • New Orleans • New York • Philadelphia • CF&I OFFICES IN CANADA: Montreal • Toronto
CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg

4239

EXHIBITS, MEETINGS

(Continued from P. 13)

Chicago. Society headquarters, 2130 Keith Bldg., Cleveland.

National Foundry Assn. — Annual meeting, Nov. 7-8, Waldorf-Astoria Hotel, New York. Society headquarters, 53 W. Jackson Blvd., Chicago.

American Home Laundry Mfrs' Assn. — Eleventh annual national home laundry conference, Nov. 7-8, Hotel Commodore, New York. Society headquarters, 20 N. Wacker Dr., Chicago.

National Assn. of Waste Material Dealers, Inc.—National fall meeting, Nov. 8-15, Hotel Ambassador, Los Angeles. Society headquarters, 271 Madison Ave., New York.

Steel Founders' Society of America—T & O conference, Nov. 11-13, Carter Hotel, Cleveland. Society headquarters, 606 Terminal Tower, Cleveland.

National Electrical Manufacturers Assn.—Annual meeting, Nov. 11-15, Traymore Hotel, Atlantic City. Society headquarters, 155 E. 44th St., New York.

American Mining Congress—Coal division conference, Nov. 15, William Penn Hotel, Pittsburgh. Society headquarters, 1200 18th St., Wash. D. C.

Air Conditioning and Refrigeration Institute—10th exposition, Nov. 18-21, International Amphitheatre, Chicago. Society headquarters, 1346 Connecticut Ave., N.W., Wash. 6, D. C.

Investment Casting Institute—Meeting, Nov. 13-16, Sheraton-Cadillac Hotel, Detroit.

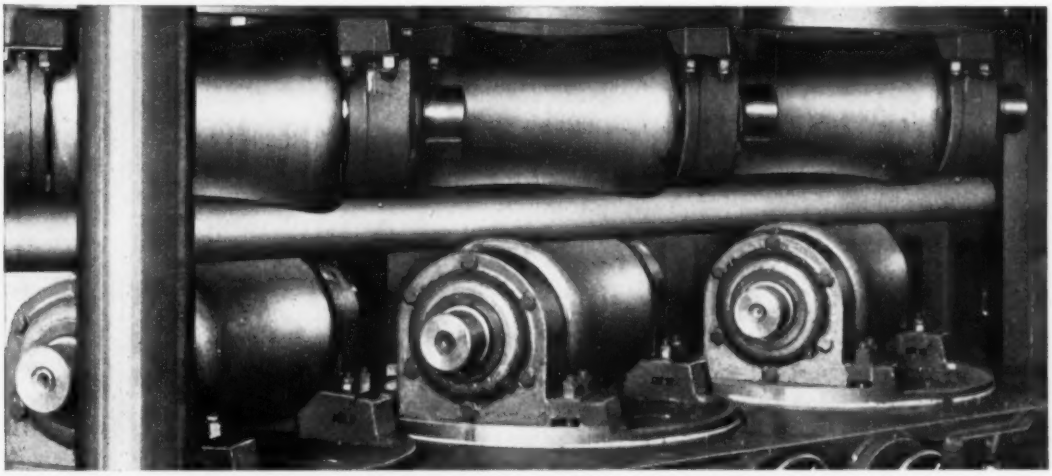
DECEMBER

American Society of Mechanical Engineers—Annual meeting, Dec. 1-6, Statler Hotel, New York. Society headquarters, 29 W. 39th St., New York 18.

TIPS FROM A ROLL MAKER'S NOTEBOOK

MACKINTOSH-HEMPHILL DIVISION, E. W. BLISS COMPANY, Pittsburgh 3, Pennsylvania

Cast mill rolls • Johnston cinder pots • rotary tube straighteners • end-thrust bearings • heavy-duty lathes • steel and special alloy castings



Line contact of rolls and tubing is shown clearly in this photograph of a tube length passing through the rolls of a Mack-Hemp rotary tube straightener.

Odd twists on roll wear in rotary tube straighteners

The production straightening of pipe and tube by passing it between concave cross rolls is quite unique in the demands it places on the rolls. For example, slippage – the bane of most rolling operations – is a necessity in a rotary tube straightener. Without slippage, the straightened tube will show spiral markings.

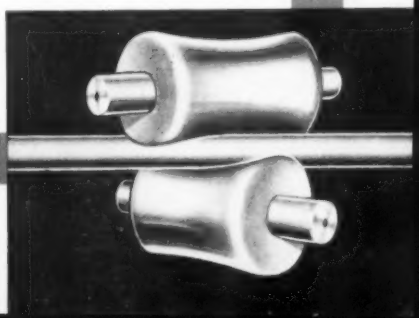
An unattainable goal—Another unusual characteristic of this service is that when properly set, the rolls should wear evenly over their entire work surfaces. This is because the tubing makes a line contact with the roll surface. Thus, under ideal conditions, straightener rolls would operate continuously to worn-out diameter without any redressing at all.

Unfortunately, it is impossible to achieve this ideal. Any given straightener is usually designed to be used with a range of tube diameters. Hence, roll curvature must be for average diameter, a compromise.

First rolls used were "overspecified"—Mack-Hemp engineers have made a very thorough study of straightener rolls – Mack-Hemp itself builds a type of rotary tube straightener. At first, we believed that hard forged steel roll rings on forged steel shafts would be necessary for neck strength and wear resistance, but soon learned that cast steel rings gave longer life. As time went on, we used integral cast steel rolls for economy. Then cast iron rings on forged steel shafts proved best for wear and finally we found solid cast iron rolls to be sufficiently strong and most economical.

Solid grain iron rolls best—Today, we use cast-to-shape low-alloy grain iron rolls in the larger straighteners we build, and recommend their use in most other rotary tube straighteners. (In small straighteners, hardened steel rolls are still practical because of the relatively higher cost of small chilled castings). Mack-Hemp "Technigrain" rolls have ample strength for this service. Casting to shape provides a uniform depth of hardness over the entire surface, while the graphite in the iron has the "lubricant" quality needed for slippage without excessive wear.

The history of tube straightener rolls shows how Mack-Hemp's broad experience in all phases of roll use can help you choose exactly the right roll. Feel free to call on us at any time . . . there's no obligation.



MACKINTOSH-HEMPHILL

You get more tonnage from the rolls with the Striped Red Wabblers

Division of E. W. BLISS COMPANY

Presses, Rolling Mills, Special Machinery

Inland Ledloy*...the original leaded steels

Twenty years ago they said it couldn't be done. But Inland tackled the problem—discovered how to add lead to steel and produced the world's first commercial leaded steel in Inland furnaces. Since then, further research and refinement has been unceasing—each new Inland technical development providing still greater production possibilities for the metalworking industry. Due to constantly improving product quality, Ledloy steels today set the standards by which all other free machining steels are compared.

This metallurgist is helping one of Inland's customers get the maximum benefits from Ledloy—the world's most machinable steels. As an expert, backed by Inland's many years of experience with leaded steels, his advice often results in better finishes, closer tolerances, reduced machining time or increased tool life for Ledloy users.

Men like this who had a part in Inland's pioneering and developing of leaded steels, have literally grown up with Ledloy. Through the years they have worked closely with users in hundreds of applications. Experience such as this cannot be matched.

Experience makes Inland Ledloy better

INLAND LEDLOY is sold in cold drawn form, under various trade names, by leading cold drawers and steel warehouses from coast to coast.

INLAND STEEL COMPANY *38 South Dearborn Street • Chicago, Illinois Sales Offices: Chicago, Milwaukee, St. Paul, Davenport, St. Louis, Kansas City, Indianapolis, Detroit, New York • *registered trade name of Inland Steel Company, pioneer in the development of leaded steels.*

Inventions Wanted

The government is making an urgent appeal to non-government technicians for answers to 387 unsolved scientific problems. Among items high on the list are a lightweight substitute for steel, a low alloy steel suitable for high-strength gun tubes, magnetic materials that'll withstand 10,000°C, light metals and alloys with strength equivalent to structural alloy steels, and a lightweight material to replace lead for gamma-radiation shielding.

Good at Low Temperature

Cast carbon steels show good low-temperature impact properties, according to a British report. Materials in the normalized condition outperformed those that were annealed. In terms of chemistry, the combination of low carbon and high manganese proved a definite advantage. In all cases, tempering in the temper-brittle range adversely affected impact values.

Solder Without Flux

Joints in aluminum made with a new fluxless solder are stronger than commercial aluminum itself. By using a high purity alloy, the solder penetrates the oxide and wets the aluminum without flux or abrasion. The new technique is most effective for butt and "T" joints where surfaces are accessible to a solder stick.

Nylon Coatings

Versatile nylon is now available as a smooth, long-wearing, high-impact protective coating for metal, wood, glass and ceramic. It's applied by preheating the part to be coated, then immersing it in a fluidized bed of powdered plastic. Result is a mirror finish, free of pinholes, bridging and runs. The patented process also works on polyethylene, epoxies and other resins for builds up to 40 mils.

Train For Sale

Most key people in the aluminum industry and railroading admit the aluminum passenger car is a flop. A quick check on aluminum trains put into service a year or two ago shows they've been relegated to short-run and commuter service. A major eastern railroad hasn't denied rumors that it's trying to sell its aluminum passenger train. But aluminum people aren't dismayed; they say their big railroad market is on the freight end.

High-Strength Adhesive

One drop of a new liquid adhesive between the faces of two steel rods sets in 20 seconds and develops a bond of 5000 psi in 48 hours. The adhesive works equally well with other metals, glass, wood, ceramics, rubber, and plastics. Biggest uses are expected where speed in setting is required and where joining surfaces are small.

Looking for Work

An estimated 90 pct of machine-tool firms in the Detroit area are reported to be in real trouble. Orders have fallen off sharply and backlogs have been eaten up. The situation is attributed to cutbacks by the military, and the fact that plant expansions have virtually halted.

Prevents Quench Cracks

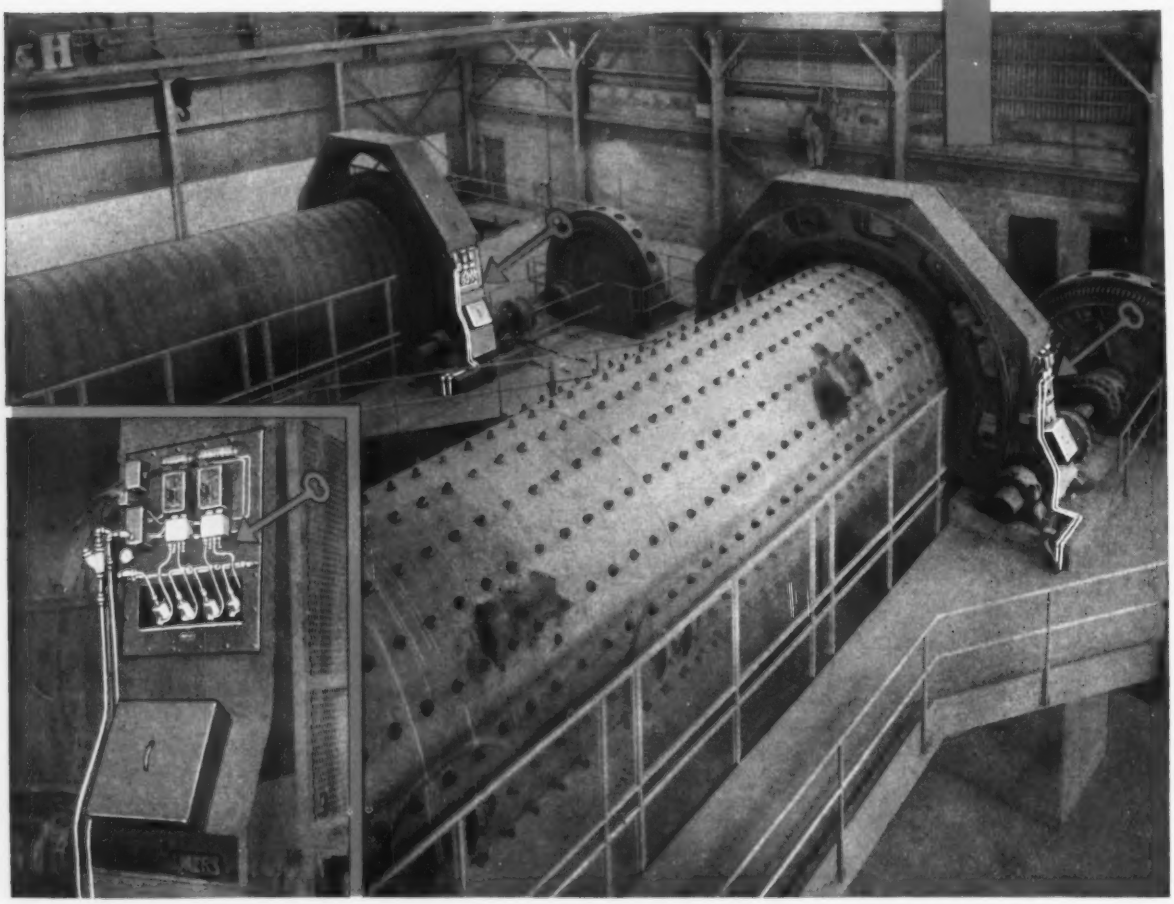
An electronic device appears to have solved the costly problem of steel quench-cracking. The device has two main parts: an electronic controller which quickly detects changes in magnetic permeability, and a sensing coil that's immersed in the tank and doesn't make direct contact with the work. Equipment can be adjusted for large or small parts, is stable enough to use in regular production.

Analyze Solutions Faster

Metal content of solutions a thousand times more dilute than previously analyzed can be measured accurately with a rapid new technique. The electrolytic method, for example, will measure one part of lead in five trillion parts of solution. Sensitivity is such that lead absorbed into the solution from the glass walls of a container will upset the reading.

Mill gears at new Bessemer cement plant protected by Farval spray panels

FARVAL—
Studies in Centralized Lubrication
No. 206



KEYS TO ADEQUATE LUBRICATION—
Farval spray panels on mill gears are indicated by the red key arrows above. Inset at left shows close-up of the spray panel system which can spray grease on gear and pinion at any desired time interval.

In a cement plant today, it pays to simplify and streamline production. Demand mounts higher and higher and puts a premium on increased output.

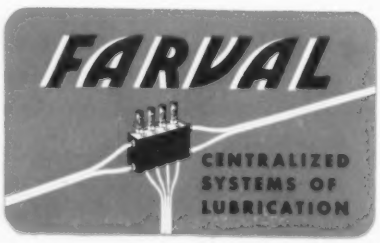
One simple, easy, inexpensive aid to faster, greater, trouble-free production is Farval. A Farval Centralized System takes the headaches and delays out of lubrication.

The Bessemer Limestone and Cement Company is another cement producer that has *Farvalized* a new plant. This photograph shows the raw mill and finish mill in the Bessemer's new plant at Bessemer, Pa., both equipped with Farval Spray Panels which automatically lubricate the mill drive gears.

There's a Farval system designed to serve your needs, too. It can save you money four ways—in reduced downtime of equipment, in bearing expense eliminated, in hand-lubricating labor and in oil or grease saved.

Ask us to mail Bulletin 26-S. And a representative will call at your convenience. The Farval Corporation, 3282E. 80th St., Cleveland 4, O.

Affiliate of The Cleveland Worm and Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.



LONG VIEW: Discussing details of 1965 sales forecast at Republic's Commercial Research Div. are l. to r., W. P. Carlin, economist, F. R. Widmer, ass't. mgr., C. B. Nelis, chief clerk and P. J. Sandmaier, mgr.

How Smaller Firms Can Make Sales Forecasts

By P. J. Sandmaier—Manager, Commercial Research Div., Republic Steel Corp., Cleveland

Sales forecasts are an invaluable tool for modern sales management. They're used to gage future markets, check competition, plan purchases.

But some firms think the cost is too high. Here, step by step, is a program geared to the needs of smaller companies.

■ Many small and medium-size companies have never before felt the need for a sales forecast. Their production until just recently quite likely has been fixed by capacity rather than demand.

Now, with some part of their expanded capacity standing idle, management is turning to the sales executive with the question, "How much will you sell—next month, next quarter, next year?"

A sales executive develops a feel for the market as he follows the order flow and talks to his customers and salesmen. This in turn is tempered by his reading of business publications and his contacts in trade associations.

Needs Staff Help—With this information he can make a reasonable short-term forecast. It is a rare executive, however, who will venture a forecast of actual volume in units or in dollars. Few of them are equipped to do detailed statistical analysis without staff assistance.

What then is needed to do a minimum job in scientific sales forecasting?

An accurate quantitative forecast, even in the short term, calls for statistical tools tailored to the needs of each company.

Many smaller companies are adding the forecasting function as a "one-man-team" and are doing an excellent job. In this case the forecaster must be picked with great care. He must combine several skills that are spread over two or more men in a larger company. If he has had some

experience with a diversified market research department so much the better. With the experienced man as a foundation, additional men can be added when needed.

Gather Facts First—A company should not expect quantitative forecasts of its own business from a new man for some time, say, perhaps a year. A great deal of preparatory work must be done first to accumulate a background of facts and statistics.

This does not usually come easy nor quickly. But the caliber of the final results will depend on this preparation. As a simple example, the forecaster must first study his company's products, and place them as accurately as possible within the framework of the economy.

He must first of all consider what kind of a product he is dealing with. Is it a raw material, a fabricating material, a component? Is it a capital goods product or consumer product? To whom is it sold and how —through what distribution channels?

Classify Products and Markets—Usually it is necessary to start some kind of formal classification whereby each order is coded to indicate the market and the product. If this coding of orders is properly done the final result will be an ability to predict with reasonable precision the effect outside forces will have on company sales.

For example, if it is known that 20 pct of Product "A" is consumed in the production of autos, 60 pct in machine tools and 20 pct in miscellaneous industrial uses, the forecaster has a start on his forecasting job.

Why Make A Sales Forecast?

1. **Sales Planning**—Where are you going? Relative to your competitors—to general business.
2. **Competition**—Your most successful competitors are already forecasting.
3. **Production**—Is production in line with future sales? How about product mix? How about inventory position?
4. **Purchasing Programs**—Are you planning your raw material supplies?
5. **Financial Plans**—What will your cash position be a year from now? Or beyond?
6. **Capital Spending**—Expansion, obsolescence, replacement.

Key Points in Sales Forecasting

1. Assign the responsibility for forecasting to one man who is carefully chosen for the job.

2. Permit him to employ the services, if needed, of outside consultants and statistical services.

3. Code your shipments by markets.

4. Do statistical background work to establish your relationships with markets and industry.

5. Make contacts with trade associations and market research departments of your larger customers.

6. Make regular forecasts—revise regularly.

7. Make sure all departments of the company use and understand the forecast for sales planning, purchasing, etc.

Most companies have some type of product code. Usually such codes were constructed for accounting and for cost use with perhaps too little thought to their possible use in sales evaluation.

The most desirable situation is one in which a single code number serves both accounting and sales departments. From the sales standpoint it is seldom necessary to break a product into as many sub-groups as may be desirable for cost accounting.

Check Trade Figures — A new forecaster is lucky indeed if he finds that his company has adequate product statistics for the past five to ten years. But most industries have trade associations; many report production statistics on a monthly basis. Check first to see if your products move with one of these markets.

A market code is almost never set up until a company makes a start at sales forecasting. This is usually the second major task that the forecaster must undertake. The final market coding which a company adopts probably will be keyed into several statistical series from various sources.

Analyze New Orders — At this point our forecaster is now prepared to provide his management with a valuable daily record for day-by-day use—which has laid the foundation for, and should have created interest in his future forecasting job.

The codes we have mentioned should be placed on each incoming order. This will permit an analysis to be made either at the time of order entry or after shipment. Where products have a long production cycle it is almost essential that orders be analyzed at once. Tabulations at this stage are very valuable to the forecaster.

Use Past Data—Having gathered all available back statistics and set up a program for coding incoming orders, the forecaster's next job is to milk his back data dry of all worth-while information. Here are

some of the more important checks that should be run:

1. He should compare his company's production records with that of competing producers. If he is fortunate he will have trade association or government statistics as a basis of comparison. Otherwise, he will be forced to construct a comparison from credit reports, published company statements and from any other available material.

2. He should also compare his company and industry with growth trends in industry generally. Many a company has awakened to find itself trying to market a steam engine product in a gasoline age.

3. He should check the seasonal and cyclical pattern of his company and industry, measure their intensity and find their origin. Too frequently a normal seasonal change in the volume of orders has been misinterpreted.

Start Forecasting — So far our forecaster has been "getting acquainted" with his company and industry. The next step is the actual forecasting. During the make-ready period the forecaster should have established all of the market areas that influence his sales volume. Now he must measure the actual effect which a change in these markets has upon his company's volume.

If products are few and sold to a small number of customers the measuring process may be simple arithmetic. A well-trained statistician will have little difficulty with this area.

The forecaster's most difficult task now faces him. He must measure tomorrow's volume in those markets from which his sales volume is derived.

Check Overall Trend — If his company manufactures a product that has a derived market, that is, it becomes a part of some other manufacturer's end item, he may be faced with the task of measuring something like next year's auto production. On the other hand, if his product is a widely distributed consumer item his task may involve forecasting total consumer purchasing power.

Measuring overall economic trends must be done regardless of the nature of the product.

To make a completely independent forecast of the probable changes in the economy for a future period requires considerable manpower. This is beyond the ability of many companies.

A small company with limited funds and, say, a one-man forecasting organization must do the best possible job of adopting the various published forecasts issued by business-sponsored or business-serving organizations.

Or if more money is available a consulting firm can be hired to construct a forecast specifically tailored to the needs of your own company.

Weigh All Facts—When an adequate general forecast has been established the forecaster applies his previously constructed correlation factors and converts to a forecast for his own company. At this point there are many figures on paper but the task is only partly completed.

A forecast of general business conditions by its very nature cannot take into consideration all of the factors that are peculiar to each company. The mathematics must be modified to give them weight.

The obvious modifications include such possibilities as the introduction of new or up-dated products; the penetration of new markets or new areas; the conditions peculiar to certain large customers.

Make Revisions—No forecast has ever been completely accurate except by happenstance. Therefore, most companies use the forecast of the coming year as the foundation for a continuing system of monthly or quarterly checks and revisions.

A forecast once made should never be put to bed and forgotten by the forecaster. He must follow through to see that the forecast is used. In some instances it must really be sold to the management.

P. J. (Phil) Sandmaier is no newcomer to the field of sales forecasting and market research. Since 1945 he has headed up Republic Steel's Commercial Research Dept.

In addition to sales forecasts and market analyses his 30-man department performs a wide variety of staff functions for sales executives.

He is presently chairman of the Commercial Research Committee of the American Iron & Steel Institute.

Use will grow as management gains confidence in the job. Don't be disappointed if full use does not come over night.

In the next several years the forecaster will need all of his skills; the task is becoming more difficult. With a competitive market ahead for most products, all of our old divergent movements are returning in full force. Capital goods are high but turning down; consumer hard goods are slow; housing starts are at the bottom and may be going up; the consumer is spending more for services and less for clothing and hard goods.

How will it affect you? It's worth trying to find out.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Rebuttal to Aluminum Can Critics

J. Louis Reynolds States Company Case

Mr. Reynolds tells why his company expects to show a profit from Esso oil can contract.

Exclusive interview reports new developments, promises others. Salvage is key to plan's success.—By G. G. Carr.

▪ "Yes, we expect the aluminum motor oil can to be immediately profitable."

In this fashion J. Louis Reynolds, executive vice-president, Reynolds Metals Co., emphatically refutes rumors that his company's latest venture might be a money-losing experiment. (The IRON AGE, Sept. 26, 1957, p. 182; Oct. 10, 1957, p. 76.)

Interviewed by The IRON AGE, Mr. Reynolds contended that published speculation on his company's contract with Esso Standard Oil Co. was based on assumptions which in many cases were inaccurate. He revealed considerable information not before available to the press.

Points of Contention—Previous comments on the aluminum motor oil can have centered around three main themes: canmaking speed, metal cost, and Reynolds' unique scrap salvage plan. Mr. Reynolds commented that in each of these areas there appeared to be considerable misunderstanding and misinformation.

On canmaking speed, he said that the aluminum oil can is fully competitive with conventional blackplate cans. The blackplate can of that size is turned out at 350 per minute. On the first test, aluminum cans came off the line at 325 per min. And faster speeds require merely adjustment of conveyer angle.

Some Economies — In addition, aluminum should bring manufacturing economies, Mr. Reynolds believes. For example, the lighter metal can be stacked about twice as high as steel on pallets. Further, some can companies are now installing high-speed coil printing presses for aluminum, with substantial savings over sheet printing. Mr. Reynolds is sure that steel can be coil printed only with considerably more difficulty and less economy.

Estimates Too High—Mr. Reynolds took issue with published estimates of aluminum sheet cost of 6.6¢ per can. This figure, he said, seems to have been derived from an ingot price of 26¢ which carries a profit plus other rolling costs plus an additional profit. Thus, the 6.6¢ per can can not be a cost figure.

"Not correct" is the estimate that Reynolds is absorbing 4¢ a can over the cost of conventional blackplate cans. (Part of the error is purely arithmetical: Sheet thickness is 0.010 in.; weight per 1000 cans is 101 lb.; can weight, 1.6 oz.) In addition, the size of the orders will permit rolling mill economies, he said through mass production and automation. Details, when revealed, should prove a significant advance.

Scrap Plan Is Key—Beyond this, Mr. Reynolds pointed out that he is not free at present to reveal the price of aluminum sheet to the canmakers. But this figure, even if available, would be only part of the story, he cautioned. "Ultimately,

J. L. Reynolds: "Success . . . depends upon the scrap recovery plan."

the success of the aluminum oil can depends upon the scrap recovery plan."

The company has high hopes for its salvage plans. Esso service station operators have received the plan enthusiastically. Many are now paying $15 to $30 per month to have someone haul empty cans away. Others must do the hauling themselves just to get rid of the cans.

Critics have suggested that service stations are too widespread geographically for salvage to be practical. Reynolds replies that service stations are concentrated around population centers, points out that about 75 pct of Esso's business in the Maine to New Jersey area is within 100 miles of New York City.

All details of the salvage plan have not yet been worked out. But Mr. Reynolds revealed that his company will pay at least 5¢ per lb for the crushed cans. He warns that it would be a mistake to assume that all scrap cans will move through dealer channels.

Residue Problem Answered—In passing, Mr. Reynolds said his company expected no problem with oil residues in the crushed cans. No danger of melt contamination is seen, and smoke is regarded as a very minor problem, since melting will be done at a central location rather than at scrap dealers' yards on the outskirts of towns and cities.

How much are the crushed cans worth to Reynolds? A natural but dangerous question, says Louis Reynolds. They are worth their weight in molten metal as a percentage of total hot metal needs for filling the can order.

For example, if salvage returns on the first shipment are 100 pct, and the second shipment of sheet for cans is the same size as the first, the crushed cans, remelted, are worth 100 pct of the value of the hot metal used to make the first shipment. In other words, the value of the crushed cans is determined by the degree to which Reynolds can recycle the same metal through subsequent orders.

BETHLEHEM'S HOMER: ". . . our prices met the competitive level."

Price Probe on Again

▪ Senator Kefauver's probe into steel industry pricing policies is again underway, still without the sensational punch the Senator has sought.

This week three small steel firms which have specialized in new technological developments were called in an effort to pep up the lagging proceedings. He also heard from several cost consultants who have specialized in steel pricing.

Query Technical Leaders—Steel firms appearing, on Wednesday, were McLouth Steel Corp., a leader in development of the oxygen process; Koppers Co., a leader in continuous casting; and T. Sendzimir, Inc., developer of the hot-rolled planetary mill. National Steel is scheduled to appear Nov. 4 and 5.

Last week, the Senator spent two days questioning A. B. Homer, president, Bethlehem Steel Corp., then called off a scheduled third day. Senator Kefauver insisted that Bethlehem should have raised its prices less than U. S. Steel this summer in order to attract customers, and now should lower its prices to gain customers and boost the firm's operating rate.

Homer Points Out—Mr. Homer during his testimony made these points:

The price of steel does not affect the demand for steel. A reduction in prices now would drive many small, marginal producers to the wall, and block necessary expansion.

Last summer's $5.20 per ton price hike didn't cover the increased cost of about $8 per ton.

In its own case, an inside board of directors — composed only of company officials—is the best system, although such is not the case for all firms. It doesn't mean a blank check in voting executive salaries because all actions must be approved by stockholders.

Bethlehem, Youngstown File—Later in the week Bethlehem and Youngstown Sheet and Tube Co. filed a brief requesting trial rather than summary judgment on their application for merger.

The steel producers told the U. S. District Court in the Southern District of New York that anything other than a trial would "constitute an abnegation of this court's fact finding duties.

Inco Project Rolls Back North

Building a giant nickel operation in the Canadian wilderness is a monumental job.

Here is a report on Inco's project, its progress and problems.—By G. F. Sullivan.

▪ Millions still think that America's last frontier was closed with the winning of the West. A somewhat smaller number, mostly Canadians, know that nothing could be further from the truth. For men who have what it takes, for companies with the fortitude and the funds to tackle it, the northern frontier is wide open.

Lower power costs and a wealth of minerals are the lure of the North Country. Power in countless streams waiting to be harnessed by turbines; minerals, including uranium and iron—and now nickel.

Man Behind It—Perhaps it is symbolic that the man responsible for the newest outpost on our northern frontier is a big miner who started his working life in the California gold fields. He's Ralph D. Parker, vice-president and general manager of operations, International Nickel Co. of Canada. Last week (The IRON AGE, Oct. 24, p. 300) he played host to a trainload of officials and reporters who arrived in the Thompson-Moak Lake area of northern Manitoba. The occasion was a last-spike driving ceremony marking rail connection of the area with the outside world.

Facts and Figures—The spot is some 400 airmiles north of Winnipeg—but it took the sleek special 25½ hours to make the run. The train pulled into the bush over a new 30-mile spur, which cuts off from the main line to Churchill, some 300 miles further north on Hudson Bay.

"We built the 30-mile spur ourselves to save time," said Mr. Parker. "The railroad will eventually take it over." And nice business it will be: When the nickel mines and their smelter, concentrator and refinery are ready, they will need 375,000 tons of supplies a year to

IT'S OFFICIAL: Ralph D. Parker, Inco vice president; C. Bullard, asst. cmdr., Manitoba, Royal Canadian Mounted Police; Douglas L. Campbell, Premier of Manitoba, officially open rail spur.

HUDSON'S BAY POST: Once trading post for Indians, store now sells clothing, cookies, etc.

SECTION GANG: Tie and tracklaying equipment in action on rail spur to new Inco mining area.

Frontier

keep them going. The mines will have a 9000-ton-a-day ore capacity, an annual capacity of 75 million pounds of nickel.

Inco has spent $10 million in exploration there to date, will have put up a total of $115 million by the time the mines are producing in 1960.

Logistics Problem—During the past winter, some 30,000 tons of supplies were moved in by diesel-powered tractor trains, at a cost of about $14 a ton. This "Snowball Express" took 14 hours to make the 70-mile round trip from the nearest rail shipping point; carried two crews on each of 24 "trains."

Helicopters, ski planes, and, in the summer, float planes, hauled food and personnel. This ran up a bill five times that of the tractor operation.

Thompson, site of the construction camp, had been off-limits to the wives of the Inco engineers, who live 22 miles away at Moak Lake and were flown over for the occasion. At the camp men generally work a 9-hour day, pay $2.50 a day for room and board, think nothing of saving $800 a month.

40° Below—What about the cold? "We live in Butler buildings at the Lake and it doesn't bother us," said the wife of an Inco engineer. "We do take a few precautions; when it's 40 below and you want to get out for Christmas, it's a good idea to allow a few extra days in case the train is snowed-in," she added.

Right now, construction men are working on the main buildings, warehouse, change house, refinery, etc.

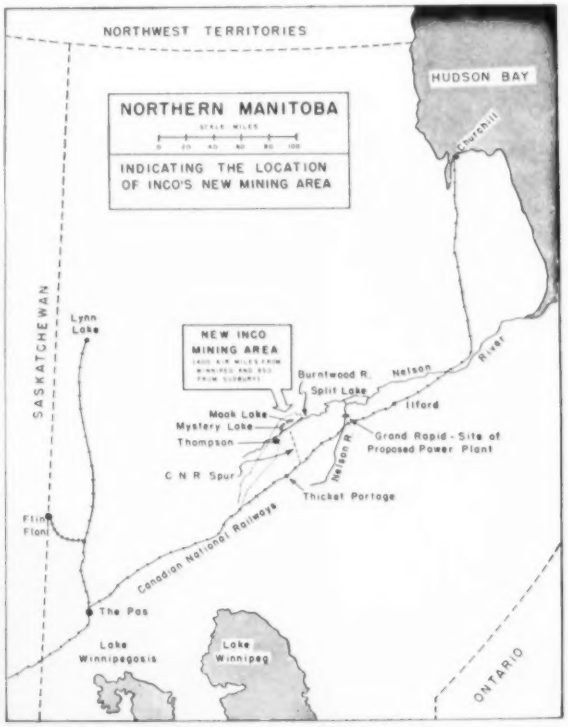
Work in Progress—Next project is to start on a brand new community of 700 houses, to eventually reach 2000. It will have five schools and a community center.

Meanwhile, the single Mountie who covers the area from his base some 200 miles to the south, will undoubtedly have to be replaced by a detachment.

Will things slow down now that winter is about here? Not noticeably. "The North really comes alive in winter," said Robert Simpson, Member of Parliament for the Churchill area. "That's when logging operations really roll, that's when the trappers go out on their lines. And that's when everything that has to be moved into the bush is moved."

HYDROPOWER: Power for nickel production will come from dam to be built here by government.

BEFORE FREEZEUP: Plant area and construction camp get ready for long, cold winter season.



FAR NORTH: More than 500 miles north of the border, closer to Hudson Bay than to the U. S., Inco's new mining area will soon be producing nickel. A new rail spur will replace tractor trains and air traffic as supply carrier to the remote area. But with easier access comes new series of social changes for the community. Once a bachelor monopoly, wives will soon enter the area. Schools and stores will follow.

Stockpile Policy Revamp Likely

Study of mobilization stockpiling, amounting to crash review, will be undertaken by special citizens committee.

Group may recommend that U. S. build supplies of some metals and minerals not now being purchased.

▪ Drastic revisions in the government's basic mobilization stockpile program appear to be coming.

A special citizens committee, composed of about a dozen "objective experts" on metals and minerals and other stockpile materials, will be named soon to take a long, hard look at the stockpile program.

This study, to be made for the Office of Defense Mobilization, amounts to a crash review, top government officials indicate. ODM head Gordon Gray makes it clear he wants the committee's recommendations in a hurry. He hopes they can be finished "in a matter of months," indicating he wants action soon after the first of the year.

New Candidates?—Lightning-fast developments in the missile-atomic age obviously are touching off the review. In discussing some of the areas which the committee will survey, and its possible findings, Mr. Gray says the group may recommend that we hoard some metals and minerals which are not now being purchased — probably special high temperature alloys and similar jet-age products.

The survey will be a "broad-range" re-evaluation of present stockpile policies, programs, and procedures. The committee will look at the strategic and critical stockpile programs material by material, as well as the supplemental hoard. It will not study policies affecting the barter of agricultural products for goods for the supplemental stockpile, which is handled by the Agriculture Department.

Three Types of War—Another problem to be studied by the Committee will be whether the government should dispose of stockpile goods it may find obsolete. Mr. Gray admits that disposal of stockpile commodities creates "all sorts of problems," international, economic, political and security.

He expects the committee when it makes its recommendations to put a "year figure" on what the nuclear-age stockpile policy should be. Originally, stockpiling was to take care of a five-year war, but that has since been reduced to three years, and will probably be further reduced. He says, however, that the committee will be asked to consider the stockpile not only for a missile-atomic attack on the U. S., but also a limited Korean type of war and for a continued cold war.

Founders Review 90-Day Clause

Founders find profitable sales turn into losses when customers abuse the 90-day shop liability clause for returning defects.

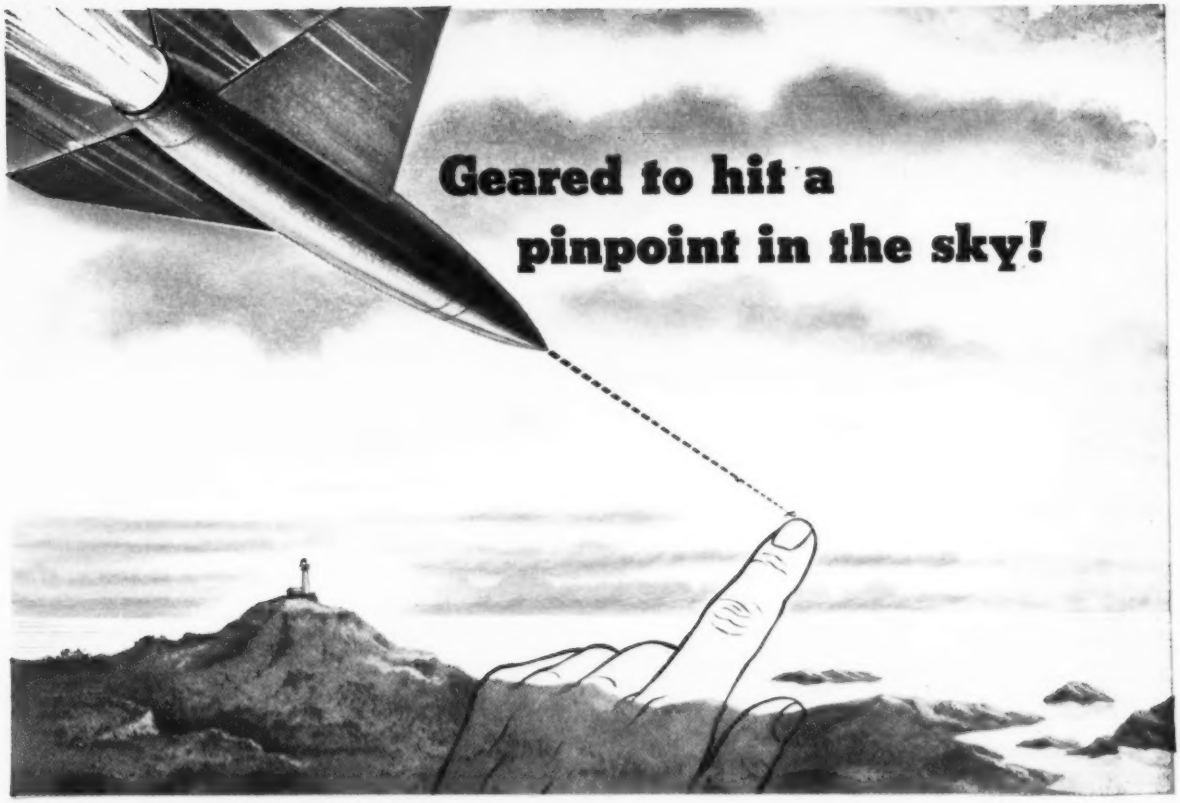
But stricter policy, while cutting costs, might also build buyer ill-will.

▪ Founders are doing some soul-searching about the 90-day clause on foundry liability for delivery of castings subject to reject for foundry defect. Torn between a natural desire to keep a good customer who is tardy in spotting defects, and their own rising costs, they're giving the whole question serious thought.

The problem is knotty. Customers have held a lot of castings as long as a year before examining them, spotting cracks, and then requesting that the vendor foundry replace them. This is certainly not typical, but when it happens, it turns a sale-for-profit into a substantial loss.

Strongly Established—The old "90-day foundry liability" clause has strong backing. It emerged as early as 1931, when the National Purchasing Agents Assn. approved a "terms and conditions of sale" policy prepared by foundrymen themselves. With revisions in 1949, the policy has become as much a part of foundry selling policy as the cost of core sand.

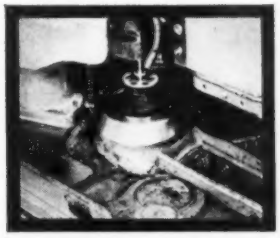
Between 70-80 pct of foundrymen today solve 90 pct of their rejection cases under the 90-day clause where the reject comes in after the 90-day period. In the troublesome 10 pct they are reviewing probable reasons for cracking of the casting while it was in customer inventory; attempting to determine whether the shipper who brought in the material is responsible; painting the castings as they leave the foundry, if permissible. The paint trick is simple, inexpensive, and if the paint has penetrated to the bottom of the crack the inspector knows immediately that the crack in the casting occurred at the foundry. Another aid where the customer habitually holds castings for long periods is to date the casting.



Research and development are constantly extending the range and speed of modern military aircraft and missiles, making higher and higher demands on counter-measures as well.

In designing counter-measure controls to the high degree of accuracy required for our air defense, engineers are specifying gears of greater and greater precision and gear trains whose combined errors are almost infinitesimal. In many plants, gears which meet these specifications are being turned out on *standard* Fellows equipment at a high rate of production.*

To combine extreme accuracy with high production rates, look to the complete Precision Line of Fellows gear production equipment. Fellows Gear Shapers are available in a full range of capacities from 1/16" to 120" P. D. Write, wire, or phone any Fellows office.



*For example, Hughes Aircraft makes up to 15,000 fine pitch gears per month with tooth-to-tooth composite error as small as 0.0003"...on standard Fellows equipment.

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78 River Street, Springfield, Vermont
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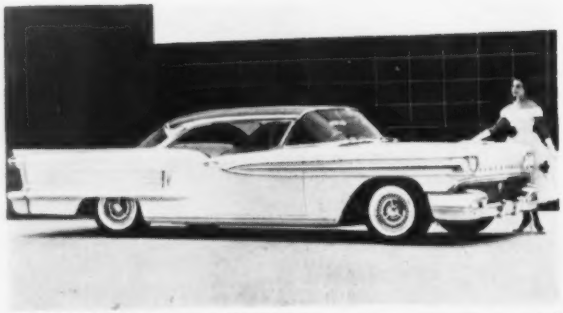
THE PRECISION LINE **Fellows** *Gear Production Equipment*

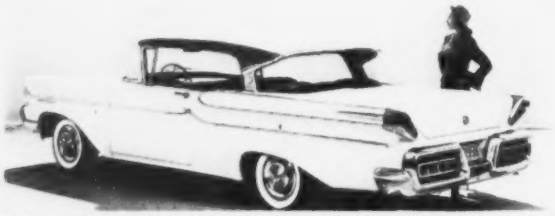
Curtain Goes Up on 1958 Autos

Seven automobile producers this week unveiled their 1958 models in showrooms throughout the nation. The big question: How will they sell?

Most show marked styling changes over 1957. All claim significant engineering advances.

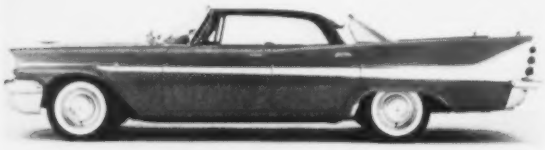


OLDSMOBILE: "98" Holiday coupe uses horizontal trim to bring out flowing lines and low silhouette.

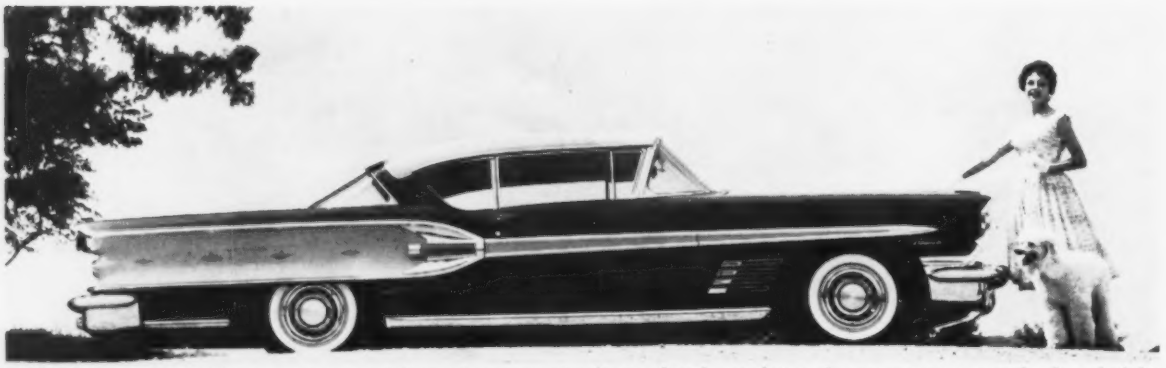


MERCURY: Two-door Monterey boasts a crisp roof line, thin rear pillars, toned-down rear quarter panel.

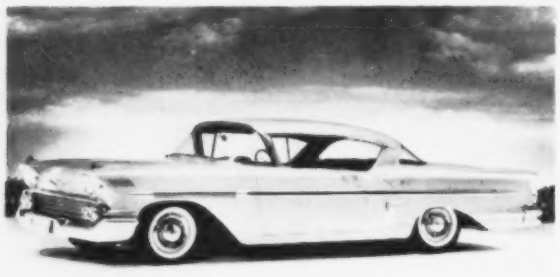
LINCOLN: Premiere hardtop is restyled along classic Continental lines; has canted, dual headlamps.



DE SOTO: Four-door Sportsman Fireflite features long, highswept tail fins canted outward, new grille.



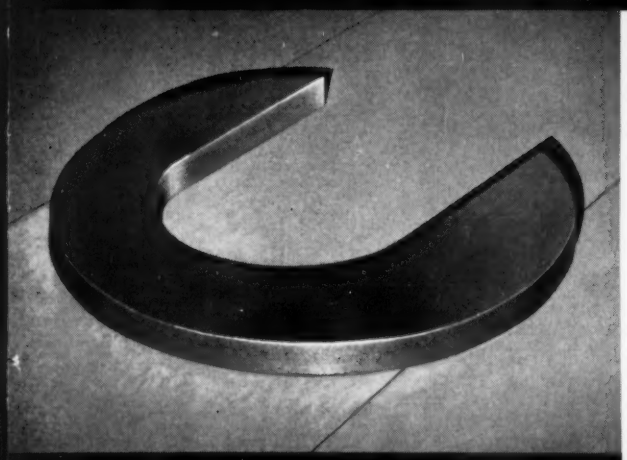
PONTIAC: Bonneville sport coupe styling places emphasis on deeply sculptured rear quarter panels, low height.



CHEVROLET: Bel Air Impala sport coupe shows fresh, re-design of Chevrolet body, plus new engine.

FORD: Fairlane 500 Victoria models reveal Ford's new front end and rear deck lid styling, new roof.

Gardner cylinder-type abrasive cuts 30% from grinding time



. . . change to Gardner 20" diameter disc from 18" segments steps up production on hardened steel washers

production data

Part	Hardened steel washers
Fixturing	Magnetic chuck
Stock Removal	.006" per side
Flatness	.001"
Parallelism	.001"
Uniformity	.002"
Production	185 parts per chuck load in 2 minutes

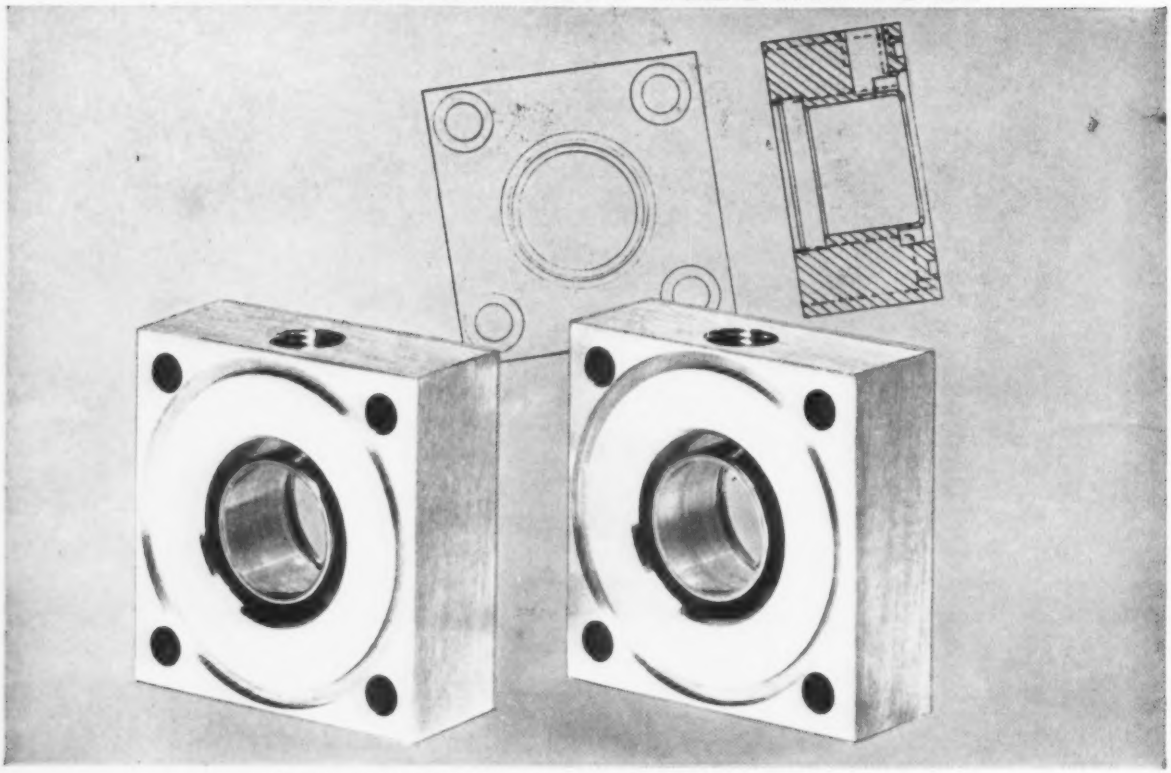
GARDNER

abrasive discs

BELOIT, WISCONSIN

THEY LOOK ALIKE...

but one takes 1/3 as long to machine with BRIDGEPORT ALUMINUM



Note close-tolerance finishing on cylinder head. The uniform structure of Bridgeport Aluminum makes machining and drilling fast, easy, economical.

	Steel	Bridgeport Extruded Aluminum, Alloy 6061-T6
MATERIAL		
MACHINING CYCLE	15 MINUTES	LESS THAN 5 MINUTES
OPERATIONS PERFORMED	9	3
TOOL LIFE	MINIMUM	SUBSTANTIAL INCREASE

In planning the production of the front and rear heads of its air-hydraulic cylinders, Alkon Products, Hawthorne, N. J., originally considered machining them from steel. Then the Bridgeport Man arrived with a briefcase full of ideas. Now these parts are machined from Bridgeport Extruded Aluminum bar stock. The comparative story above tells why.

Add these other benefits – the ease of handling the bar stock . . . the lustrous, sales-appeal of Bridgeport Aluminum . . . elimination of rust and corrosion problems in inventory and storage . . . savings in shipping weight and strength of packaging required.

If you have a parts problem that might be solved by aluminum extrusions, let the Bridgeport Man in your locality know about it. He'll be glad to call and give you the benefit of Bridgeport's ideas and experience in aluminum extrusions.

Alkon Products Model "D" Cylinder, with front and rear heads of Bridgeport Extruded Aluminum, exceeds JIC standards for air, water, oil.

For the very newest in

Bridgeport BRIDGEPORT ALUMINUM

Aluminum Extrusion and Forging Facilities at Adrian, Michigan

Bridgeport Brass Company, Aluminum Division, Bridgeport 2, Connecticut • Offices in Principal Cities

Arvid O. Lundell

Reorganizing the Painless Way

BDSA's new metalworking advisor brings some interesting industry experience to Washington, D. C.

He has proved that a company can be completely revamped without going through management upheavals.

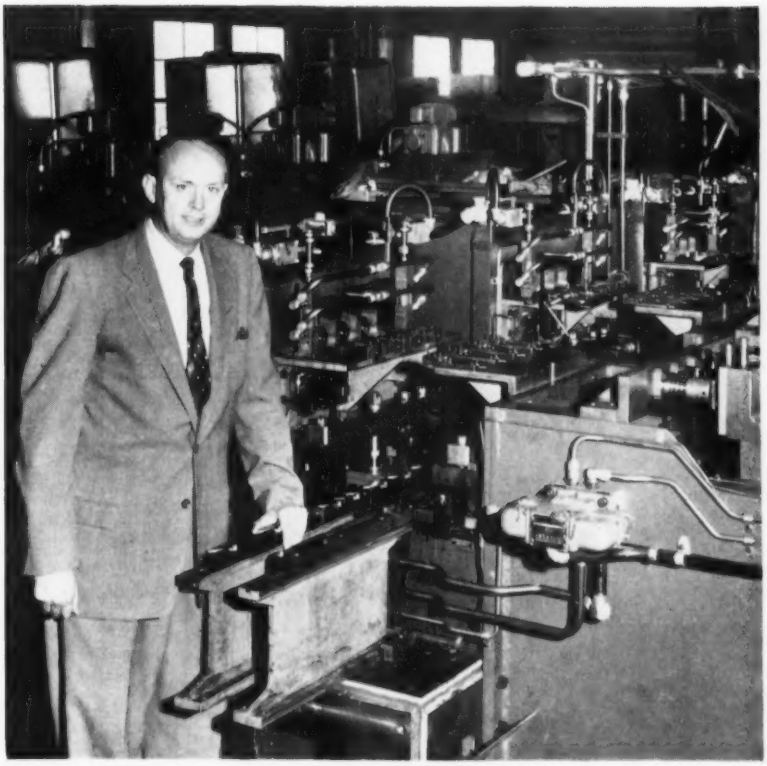
▪ In a few short years, Arvid O. Lundell converted Colonial Broach and Machine Co. from an old-line organization into an up-to-date machine tool company by applying a fundamental theory: The success of a business depends not so much on who runs it as how it is run.

At first glance, this theory might seem too superficial to be of value. Yet behind it is a weighty business philosophy.

How He Did It — When Mr. Lundell, at age 30, took over as president of Colonial Broach in 1946, he had a big modernization job cut out for him. Under such circumstances, another executive might have started swinging the personnel axe. Mr. Lundell did no such thing. He made the change-over to a modern organization and retained the same management staff.

How did he do it? Mr. Lundell says the secret lies in changing management philosophy and methods. True, he has added some new blood —principally younger executives. But they were in line with expansion.

Cost Conscious—A key to his successful switch in management thinking is the concept of "progress," a good old word that has been worked to death but which Mr. Lundell resurrects and revitalizes.



A. O. LUNDELL: Change your management methods. Keep your people.

His concept of progress reaches into all phases of operations. The engineering department has been infused with a highly progressive approach to product development. A result is that more new developments have come out of Colonial Broach in that period than at any time in its history. A highly effective advance costing system has been put into action.

Education Underscored — Under former hiring practice at Colonial, stress was laid on hard, practical experience. Now, emphasis is placed on educational qualifications.

Mr. Lundell, himself, has a broad educational background. He attended Culver Military Academy, studied at the University of Detroit, has taken a number of night courses, believes strongly in refresher courses. His first full-time job was with Michigan Tool Co. in 1935.

Appointed to U. S. Post— Twenty-two years later finds Arvid Lundell among the top men in his technical field with the added reputation of being a superior organizer.

On Oct. 1, he arrived in Washington, D. C. to serve a 6-month tenure as Advisor to the Director of the Metalworking Equipment Div., Business and Defense Services Administration. Working with Niels A. Olsen, the newly appointed director, Arvid Lundell will contribute his knowledge and philosophy toward the betterment of industry generally.

Dollar Indicators Don't Tell All

Almost everyone predicts a record Gross National Product next year, but almost no one is bragging about it.

Because of predicted inflation, GNP and other dollar indicators won't mean much in evaluating true business conditions.

■ You'll get small consolation from watching the Gross National Product soar to record heights in 1958. Most of the increase, if not all of it, will be accounted for by higher prices.

GNP, which measures total dollar output, served as a pretty reliable index in the years from 1952 through 1955. In this period, prices remained amazingly static. Fluctuations quite accurately reflected the ups and downs of the economy.

Economists Predict—This is reflected in the F. W. Dodge Corp. annual survey of economists' opinions. The analysis of opinions indicates most believe the GNP will continue on up to record levels.

But, the analysis notes, ". . . comments paradoxically take little note of this fact. Instead, the words 'decline' and 'recession' appear with some frequency, and none of the comments express real optimism . . ."

Four Main Points—Results of the survey revolve around these four points:

1. Total dollar output in 1958, as measured by GNP, will rise slightly.

2. Hourly wage rates continue to go up in all major categories.

3. The cost of living will continue to rise in 1958, and wholesale prices will also go up, but not quite as rapidly.

4. Real output, as measured by the Federal Reserve Index of Industrial Production, will dip in the first half of 1958, and then rise slightly during the last six months.

Index Predictions — The conclusion is that virtually all the dollar indicators will go up, on the basis of inflation. The economists predict the consumer price index will rise from current level, of 121, to 123 by the end of 1958.

The Bureau of Labor Statistics wholesale price index is expected to climb from 118 to 119 in the same period. It's predicted that Gross National Product will run at the rate of $449 billion in the fourth quarter of 1958, compared with the second quarter this year of $434 billion.

. . . If Recent Price Trends Continue

Following the Trend — Actually, these predictions follow pretty much the trend of the past two years. Unless the unforeseen appears on the economic horizon, the upward price trend is almost sure to continue.

Of course, a business leveling or decline is in progress. But the general economic law of declining prices in a tightening economy appears to be in a state of temporary repeal.

Effects of Competition—Competition continues to have a restraining influence. But with most labor costs tied to an upward escalator, with service costs also on the upgrade, wholesale and retail prices will have to follow.

A study of recent price trends by the Office of Business Economics, U. S. Dept. of Commerce, points out that overall wholesale prices increased 6.5 pct in the past two years. In the same period, the consumer price index increased 5.5 pct. Commodity prices rose 4 pct, and services accounted for the other 1.5 pct.

Opposite Trends — These are some examples:

Machinery and motive products rose 7 and 6 pct, respectively, in the periods of mid 1955-56, and 1956-57. In contrast, the increase was 2 pct per year in the period from 1952 to 1955. Conversely, prices of metals and metal products increased 23 pct from August, 1952 to August, 1957, but with the advance coming before the middle of last year.

These samples point out what the OBE refers to as "mixed trends." It points out that while the economy has shown overall strength at peak rates, trends of demand have been mixed and have been reflected in differential price movements.

Specifics Needed — The price problem in the months ahead will lie in cutting through the general trends and determining the price movements in specific fields. There is no reason to believe they will follow the general upward trend automatically.

AUTOMOTIVE

Unit Body Strengthens Lincoln

And It's Easier to Assemble, Has Fewer Rattles

Lincoln Div. is first U.S. automaker to weld fenders to car body.

Welding on precision jigs eases many fitting problems—By H. R. Neal.

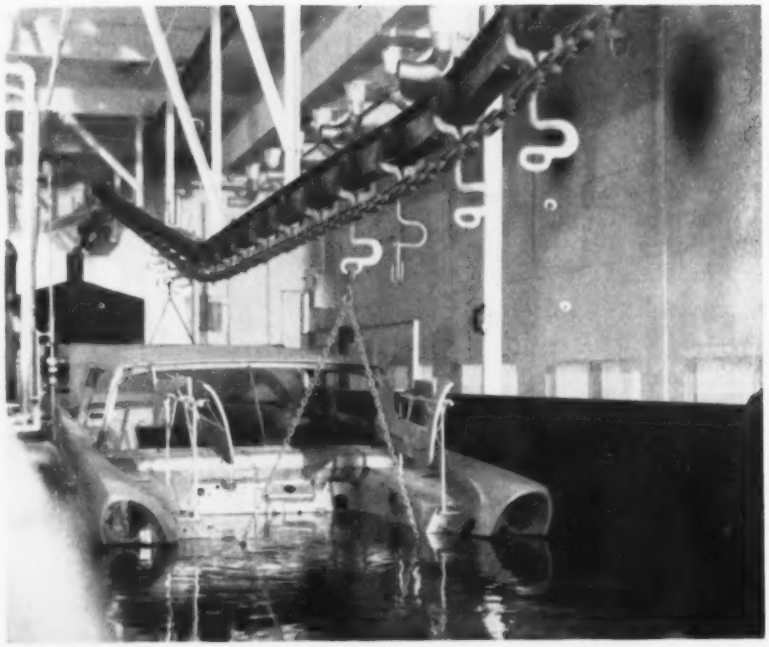
▪ Knowledge of the nuts and bolts of the business of building automobiles is practically non-essential at Ford Motor Co.'s new Lincoln assembly plant near Wixom, Mich. The reason is simple. Lincoln has junked the conventional bolted-together construction method for its automobiles. Instead, it employs unitized construction in which body and frame are built as a single unit.

Pick Your New Car

Automakers are ringing up the curtain on new 1958 models. For a picture comparison of latest models introduced this week, see p. 30.

Noticeably absent from the body build-up area in the Wixom plant is the familiar brr-rrt, brrr-rrt of air wrenches driving studs or nuts. In its place is a sputt-tt, sputt-tting accompanied by a shower of sparks — characteristic of spotwelding. There are some 7,500 welds made in each new car.

Easy Positioning—There are five main sub-assemblies of the new Lincoln body. They are the underbody, or floor, the left and right body sides, the cowl assembly, and the roof panel. These are, of course, often made up of several sections each. For example, the underbody is actually three main sections welded together.



PAINT BATH: Dip tank operation at Lincoln Div.'s Wixom, Mich. plant submerges car body in paint primer to a depth of 28 in. The method gives rust protection to interior of underbody in unitized construction.

But positioning of sub-assembly components is not much of a problem. The precision fixtures which hold the body as it is being constructed do not allow errors. Arms and clamps position the pieces and hold them firmly in place until welding has been completed. Accuracy is a must. Once a weld has been made it can't be loosened for repositioning of the parts, as is the case with nuts and bolts.

Adds Rigidity — Unitized body construction has several advantages which are becoming increasingly important in automotive construction. First is the greater torsional rigidity, or resistance to the body-twisting effects of rough road conditions, it offers. Twisting loads have been applied to the body to simulate stresses encountered on the road. This revealed to Lincoln engineers the new structure is 35 pct more rigid in torsion than the conventional body and frame.

How is this added strength obtained? Virtually every piece of metal in the body contributes to the total strength.

The Strong Points—The basic strength of the 1958 unitized body is in underbody, particularly the center section. Principal strength members, such as double box member side sills, torque boxes and cross members, are located here. The tunnel must have more strength

INCREASED DEMANDS

of AUTOMOTIVE INDUSTRY...

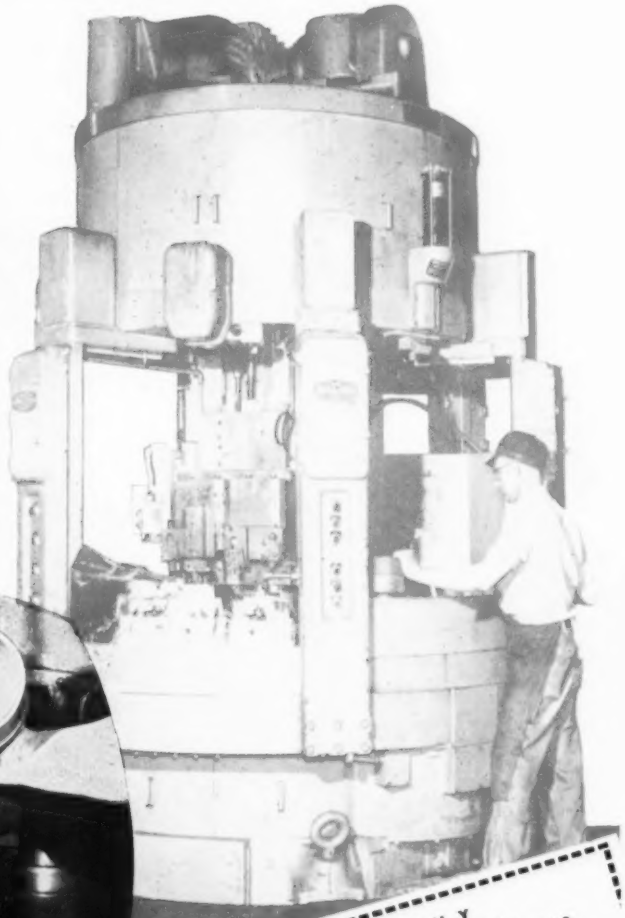
met with

BULLARD

Mult-Au-Matic, Type "L"

The challenge to supply the increased requirements for automatic transmissions needed to meet automobile manufacturers' schedules was solved at the Midwestern plant of a leading manufacturer of automotive parts with a 10" 12 spindle, single index Bullard Mult-Au-Matic, Type "L".

At present, the machine is tooled for the front drum of an automatic transmission and delivers a finished piece — turned, bored, counterbored and faced — with each index of the table — one every 63 seconds. The end result— more finished pieces per hour at less cost per piece.



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Remember to cut costs when cutting metal — buy BULLARD

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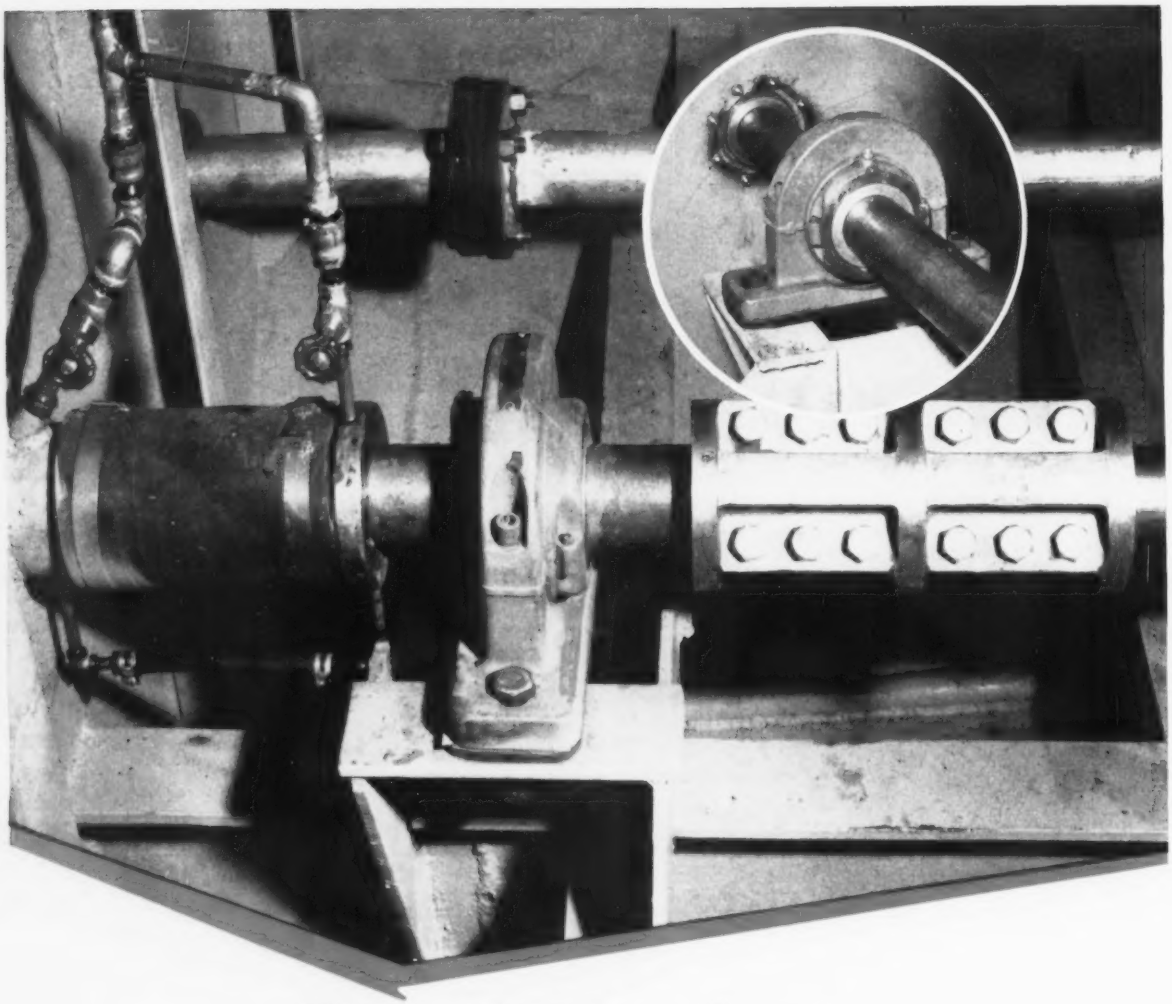

Bearings, Inc.

helps engineers design more efficient drive shaft installation and removal!

Take this ship, now in ferry service on the North Carolina Coast, as an example. Six pillow blocks were required to support two drive shafts. Since these shafts pass through bulkheads and are surrounded by other equipment, conventional pillow blocks are extremely difficult to install or replace. Engineers from our Dixie Bearings, Inc. Division recommended the *split right down to the shaft* pillow blocks shown above.

This bearing has found wide acceptance where it is impractical or impossible to mount a solid ball or roller pillow block without tearing down the whole machine. Not only did the original installation cost less, but maintenance costs will be greatly reduced.

This is just another instance of the many services Bearings, Inc. offers its customers. No matter what type of equipment you operate . . . if bearings are an important part of that equipment—we are ready and able to help you with any bearing problem you may have.

Providing bearing service in the territories adjacent to our branches, listed below.

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INDIANA: Ft. Wayne • Indianapolis • Muncie • Terre Haute
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WEST VIRGINIA: Charleston • Huntington • Parkersburg • Wheeling
NEW JERSEY: Camden • **MARYLAND:** Baltimore
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Automotive Production

WEEK ENDING	CARS	TRUCKS
Oct. 26, 1957*	103,376	21,876
Oct. 19, 1957	92,180	21,064
Oct. 27, 1956	104,269	21,698
Oct. 20, 1956	88,557	21,651
TO DATE 1957	4,907,783	887,237
TO DATE 1956	4,551,379	920,416

*Preliminary Source: Ward's Reports

than is usual since driving torque is transmitted directly to the body through two curved trailing arms attached in the tunnel area to a rear cross member.

A strong front end structure is completed by the welding of fender aprons and fenders. All other American auto builders bolt their fenders to the body, regardless of construction methods employed. The welded method not only cuts down on rattles, but strengthens the front end.

Light Gages Contribute—In addition to the heavy gage structural members in the unitized body, lighter sheet metal panels contribute substantially to the stiffness of the entire body structure. These panels include the structures formed by the joining of the front fender, fender apron, dash, floor panel, wheelhouse, quarter panel, lower back panel, and roof.

Materials being welded range from the welding of two thicknesses of .036 in. through two thicknesses of .090. Frequently this must be done by the same portable welding gun.

What about welding speed? The 1958 Lincoln has an all seam welded roof. Some 700 welds, spaced about three to the in., are made in the roof in less than one minute. This, they say, makes the roof practically leak proof—even if the sealer is omitted. A low maintenance needle bearing type seam welder does the job.

Fitting Problems Reduced—Unitized construction has another considerable advantage over conventional body and frame construction methods. The precision build-up fixtures and body bucks required for the all-welded construction also mean the structure is held to precise dimensions. This virtually eliminates "fitting" of doors, hoods or truck lids to openings that might be off a fraction of an inch. Openings just aren't off that fraction. This should also enable Lincoln to provide a uniform seal around door openings—often a problem with auto makers.

Rattles, too, are eliminated. Nuts and bolts that don't exist can't loosen. Therefore, they can't rattle. A Lincoln owner in the future will know where not to look if his car develops a rattle—in the body. Looking for rattles can be confined to knobs, suspension system, bumpers and the other "tacked on" components.

Rust-Proof Dunking—An added assurance of rattle free performances can be found in the new rustproofing process devised for the 1958 Lincoln. Conventional spray procedures have been dispensed with. Instead, the unitized body is immersed to the beltline in a paint tank. Internal and external surfaces of the underbody assembly are thus rust protected. These surfaces include the insides of side rails, box members and cross members.

GM Steps Up Foreign Car Production

General Motors Corp. European subsidiaries will build about 391,000 vehicles this year. GM president Harlow H. Curtice, currently touring Europe, reports the Vauxhall Motors plant at Luton, England, will produce a record number 160,000 vehicles in 1957. GM's Adam Opel plant, at Russelsheim, West Germany, is expected to produce 231,000 passenger cars, trucks and vans during the same period.

Vauxhall's $101 million expansion and modernization program, begun in 1954, will enable the firm to produce in excess of 250,000 vehicles, Mr. Curtice said. In 1956 Vauxhall produced 128,000 units. Pontiac division of GM will import about 1,000 Vauxhalls each month starting in November.

THE BULL OF THE WOODS By J. R. Williams

CINCINNATI

Diameters and adjacent radii and shoulders are precision ground in one operation on this CINCINNATI FILMATIC 10"R x 18" Angular Wheel Slide Grinder. Sizes available: 6"R and 10"L x 18" or 30" between centers; 10"R and 14"L x 18" to 72" between centers.

It Pays to Combine Precision Grinding Operations

Especially on a CINCINNATI Built for the Job

Time, effort and dollars are saved when operations are combined. And quite often quality improves, just as it does when diameters and adjacent radii and shoulders are ground in one operation on CINCINNATI® FILMATIC Angular Wheel Slide Grinding Machines. These fine precision grinders are built for high production work at the lowest cost of any equipment available today. Many features contribute to this outstanding performance.

Push-button automatic grinding cycle, incorporating coarse and fine feed rates.

Roll-out cutting fluid tank. Cuts down service attention.

***Automatic air-electric gage sizing** with cycle time stabilizer. High degree of accuracy and compensation for wheel wear obtained automatically.

***Automatic gap eliminator.** A timesaver where stock allowance varies widely.

***Behind-the-wheel profile truing equipment,** for automatic, accurate profile truing in both directions.

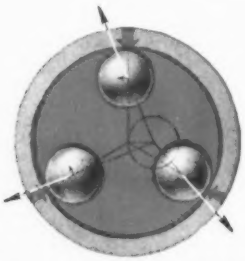
Additional features and their advantages are illustrated and described in catalog No. G-686. Write for a copy. Brief specifications in Sweet's Machine Tool File.

*Available at extra cost.

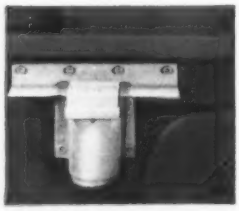
CINCINNATI GRINDERS INCORPORATED • CINCINNATI 9, OHIO

CINCINNATI

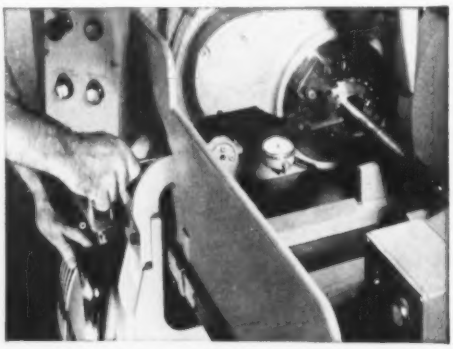
CENTERTYPE GRINDING MACHINES • CENTERLESS GRINDING MACHINES • ROLL GRINDING MACHINES • SURFACE GRINDING MACHINES • CHUCKING GRINDERS • MICRO-CENTRIC GRINDING MACHINES • CENTERLESS LAPPING MACHINES



Automatic grinding wheel balancing, an exclusive CINCINNATI feature, balances the wheel and mount within a few seconds.



Automatic hydraulic table clamp automatically locks the machine table in position during the grinding cycle.



Manual flagging device, for locating the work axially with respect to the wheels, is simple and accurate. Automatic flagging device is also available.

Who'll Hold M-Day Inventory?

Government May Give Job to Industry

Dangers of obsolescence and high cost of maintaining military stocks are worrying the defense planners.

One solution: Sell existing supplies and count on M-D deliveries from industrial inventories.—By G. H. Baker.

▪ Fresh evidence is turning up in Washington that long-range mobilization planning is about to undergo another subtle but basic change in direction.

In recent months, Washington's defense planners have been quietly asking each other if their theory on military moves in a future war is not getting a little out of date as the world moves further into rocket-and-missile concepts of warfare.

Useless Stocks?—There's a growing suspicion in inner circles of the government that the lightning-fast devastation of rocket warfare has already made obsolete many time-honored concepts about the "importance" of armor-plate, manned aircraft, tanks, and battleships.

And defense planners are becoming increasingly uneasy over the high cost of maintaining the inventories of end-products they now have in storage for use in the event of all-out mobilization.

The desire on the part of the government to reduce its inventory costs results from two drivers: The growing belief that much of these inventories will be practically useless in a future war; and the pressure to reduce federal expenses by paring down top-heavy inventory costs. See "You Can Cut Costs Through Tight Inventory Control," (The IRON AGE, Sept. 12, page 83.)

In these days of an increasingly tight squeeze on profits, business executives are finding that shrewder management of their inventories can result in lower costs of operation and thus healthier profit ratios.

Too Much Replacement — The defense planners, with one eye on this condition in industry, are now considering a reduction in their inventory costs along these lines:

A number of federal agencies—particularly the Army, Navy, and Air Force—are maintaining at high cost inventories valued at hundreds of millions of dollars worth of the end-products the planners say will be needed in time of all-out mobilization. These end-products include such items as machine tools, trucks, construction equipment, and generators.

But because of technological improvements in these products, plus the constant problem of deterioration, these inventories have to be replaced frequently—and at high cost.

Rush Deliveries — The government now is coming around to thinking that everybody would be better off if these huge inventories were sold on the open market and new arrangements concluded with suppliers for "M-Day" deliveries of the necessary products.

Under the proposals now being discussed at top levels, the government could in a future crisis call upon the manufacturers of say, generators, to supply late models from manufacturers' inventories.

In other words, industry—rather than government—is to be called upon to assume the burden of maintaining Mobilization Day inventories.

Wage-Cost Increases Nibble at Profits

Lagging Profits — The government is confirming what most manufacturers already know—that prices and wages are headed for new peaks by the end of the year, but corporation profits are lagging behind.

More and more firms find themselves caught in cost-price squeezes. This is draining the strength out of profits, for in many cases the higher costs of doing business are absorbed instead of passed on to customers.

National income was at the rate of $375 billion in the first half of this year. This is 5½ pct ahead of the same period in 1956, which was a record high. But most of this gain is due to higher wages and to higher total employment.

Still at '56 Levels—Profits, far from sharing in the 5½ pct gain are still chugging along at the 1956 rate.

In the first six months of 1957, profits were running at the rate of $41 billion, including taxes and inventory gains.

The pinch could grow worse before it gets better. But improvement is in sight for first-quarter 1958. An upsurge in government spending, coupled with the possibility of tax reduction, could inject some badly-needed pep into the sagging profits picture.

Looking for that "just-right" way to handle materials?

SEND FOR THIS BOOKLET!

"Ideas in Materials Handling"—a new, completely illustrated idea booklet—describes how the Whiting Trambeam overhead handling system takes materials from point-to-point, faster, easier . . . saving you time and money with every move. Learn how the quick "up 'n over" hop beats the floor-level haul every time. Write today! Ask for "Ideas in Materials Handling," the new booklet on moving materials overhead to gain increased production below. *Whiting Corporation, 15601 Lathrop Avenue, Harvey, Illinois.*

WHITING TRAMBEAM

How Air Cutbacks Hurt Seattle

Boeing Reductions Upsetting Economy

The area's largest employer is laying off non-production personnel, reducing hiring and screening all new purchases.

Other communities, like Everett, where 1500-man plant will close, are also feeling the effects.—By R. R. Kay.

▪ Air Force cuts have hit Seattle hard. The cutback in Boeing Airplane Co.'s spending may rock the area's previous rosy outlook.

Boeing's impact on the area's economy is great. Psychologically, any cutback, no matter how minor it may turn out to be in the long run, will have drastic results.

Business expansion programs will certainly be trimmed. Only time can tell by how much.

What's Happened — Boeing is both Seattle's and Washington State's largest single industrial employer. Its subcontracting created and kept alive many dozens of formerly booming local metalworking shops.

Exact impact of current Air Force cutbacks can't yet be forecast. But here are some telling facts from Boeing:

Overhead or non-production personnel numbering 1250 lost their jobs this month. Hiring of new employees has all but stopped. There will be little or no buying of equipment during the next months. Subcontractors have to carry more of the company's in-process work inventory. All new purchase orders are held up for a most careful screening.

Lights Out — Earlier Air Force cuts compelled the company to plan a 6000 to 8000 worker layoff in the Seattle area alone by year-end. How to reduce is fairly simple. Wherever you can, you don't replace employees who voluntarily quit.

Boeing's ups and downs affect many communities throughout Washington State. Everett, for example, has had bad news. The company's plant there makes the tooling for an advanced model of the B-52 intercontinental bomber. The 1500-employee facility will close its doors within six to eight months.

Unemployment Climbs

The worst unemployment problem since World War II. That's the forecast for Washington State by its Labor Council and it's backed up by Peter Giovine, Commissioner of Employment Security.

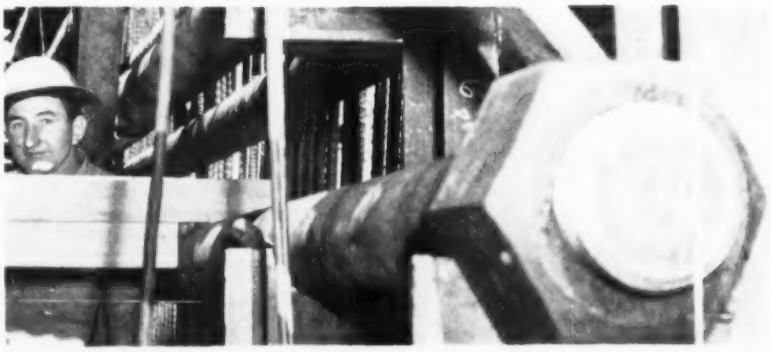
The Labor Council's president, Ed Weston, says the slump "may be even worse" than 1949's. Giovine reports there are 12,000 more persons on the state's unemployment roster now than there were at this time last year.

Engineer Need Stays

Despite defense cutbacks, demand for engineering graduates in the Pacific Northwest hasn't slackened. Job opportunities remain bright.

But James Souther, director of engineering placement, University of Washington, says new graduates will find employers more selective and cost-conscious. "Except for the very top men, students will not have as wide a choice of jobs this year. In the past, the student has been able to pick and choose—now industry will do some of the picking."

Strait Jacket for Old Man River

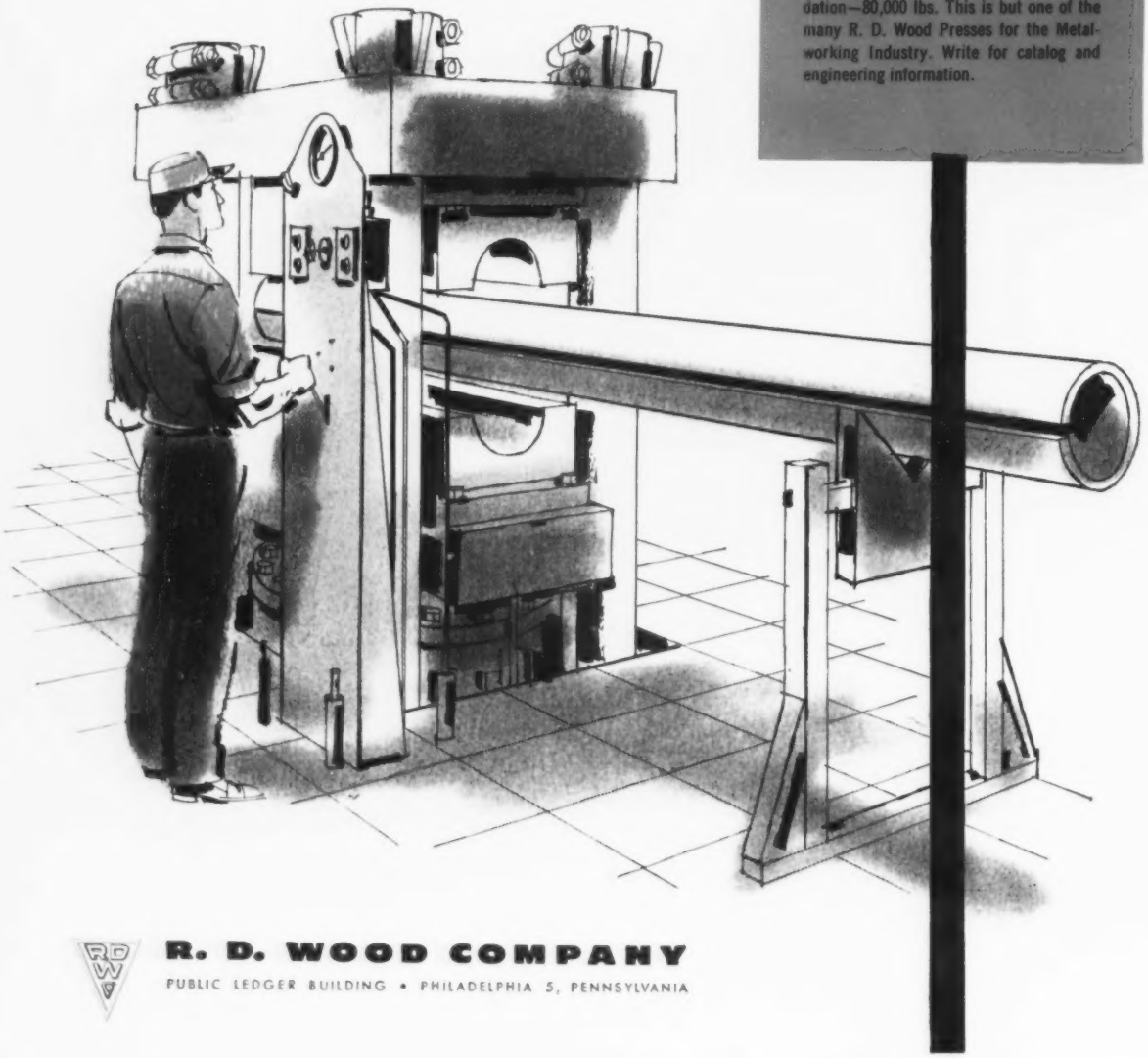


HOLDUP JOB: Threaded steel rods supplied by Bethlehem Steel will support gates holding back Columbia River when Rocky Reach Dam near Wenatchee, Wash., is complete. Put in place in one of the piers of the dam, they are wrapped in burlap to prevent concrete from sticking to them when it is poured. There will be 304 of these rods — each weighing over 4800 lb—in the completed dam. Even the nuts for the threaded steel rods are big, weighing 81 lb apiece. Rods will elongate when the gates, described as largest of their kind in the world, are containing the river.

You can design your own press at R. D. Wood

Working with numerous basic models, R. D. Wood engineers incorporate your specifications and modifications to produce the press exactly suited to your needs. You can be sure of its quality, too. For every Wood Press is constructed of selected materials by master craftsmen. This is your warranty of dependable performance and precise operation. Why not consult us when planning your next hydraulic press?

1500 ton R. D. Wood Hydraulic Press for pipe forming operations. Press has self-contained pumping unit. Dies can be replaced for various sizes of pipes ranging from 4" to 12". Floor space, press proper—5' x 6'. Height—13'. Weight on foundation—80,000 lbs. This is but one of the many R. D. Wood Presses for the Metal-working Industry. Write for catalog and engineering information.



R. D. WOOD COMPANY

PUBLIC LEDGER BUILDING • PHILADELPHIA 5, PENNSYLVANIA

Tape Controls Aim at Short Runs

Kaukauna Shows Versatile New System

Giddings & Lewis division unveils system for its line of horizontal boring, drilling and milling machines.

Meanwhile, builders at annual meeting elect officers for next year.—By E. J. Egan, Jr.

▪ Numerically controlled machine tools are reaching out for a warm handclasp from the job shop operator. The latest name to bid for recognition in the short-run machining field is Kaukauna. It's a familiar one to users of radial drilling equipment.

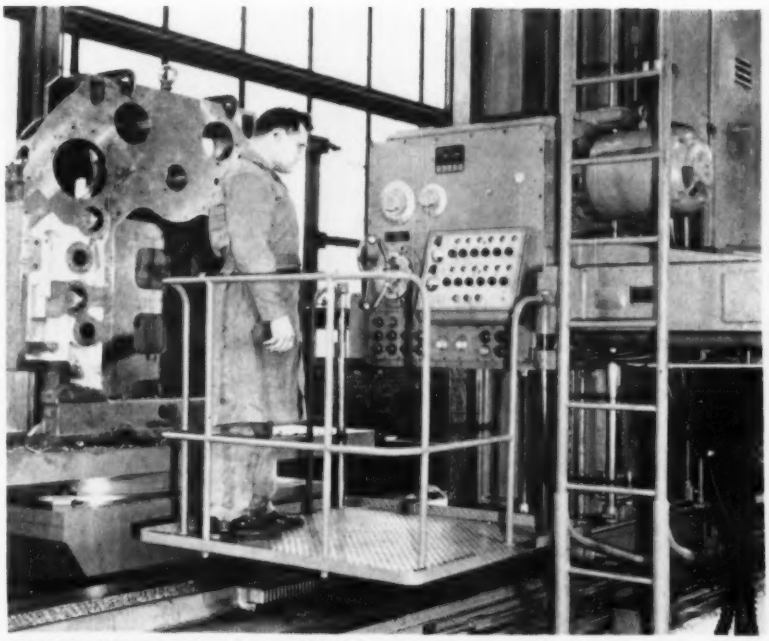
Now the Kaukauna Machine & Foundry Div. of Giddings & Lewis Machine Tool Co., the firm has just unveiled a binary code tape control system for its line of horizontal boring, drilling and milling machines.

Tape Good for 250 Pieces—The system was demonstrated on a standard, 5-in. spindle horizontal machine recently. The second such unit to be so equipped, it's slated for work on turbine components at General Electric's Co.'s Schenectady Works.

Tape used for the control system is the common Flexowriter variety. It's punched in binary code by a typist who reads coordinates, speeds, feeds and other pertinent data from a machining-process manuscript. Kaukauna engineers say each tape is good for runs up to 250 pieces.

Can Work Manually—The system doesn't dispense with a machine operator altogether. One is required to punch a "read-in" button on the control panel for each new operation.

Nor is the tape control unit absolutely essential for machine operation. Machining can be done manually if desired, or, as still another alternative, the operator can dial-in coordinates of machining locations directly from a blueprint. Electronic verniers position the machine to 0.0001-in. accuracy.



NO TROUBLE AT ALL: Guided by tiny holes punched in paper tape, this Kaukauna horizontal machine bores big ones in a printing press frame.

Economic Factors—Frank Austin, Kaukauna's sales manager, says the machine and numerical control system can pay off quickly by eliminating jig and fixture design and manufacture.

NMTBA Elects 1958 Officers

Alfred V. Bodine was elected president of the National Machine Tool Builders Assn. in the annual meeting at French Lick, Ind. Mr. Bodine is president and treasurer of The Bodine Corp., Bridgeport, Conn.

Also elected were Ralph J. Kraut, 1st vice president. He is president of Giddings and Lewis Machine Tool Co., Fond Du Lac, Wisc.

Alan C. Mattison, 2nd vice president. He is president of Mattison Machine Works, Rockford, Ill.

Walter K. Bailey, re-elected secretary. He is president of The Warner & Swasey Co., Cleveland.

Graham E. Marx, treasurer and director. He is vice president and general manager of The G. A. Gray Co., Cincinnati.

Julian C. Pease, director. He is executive vice president of New Britain Machine Co., New Britain, Conn.

Ludlow King was re-elected executive vice president.

INDUSTRIAL BRIEFS

Carbide from Canada—Norton Co. has begun construction of an addition to its Cap-de-la-Madeleine, Quebec, silicon carbide processing plant. Expansion is being made to meet the growing demands for silicon carbide for both abrasive uses and high temperature refractory applications. Facilities should be in operation by the end of the year. The Quebec plant was purchased by Norton in 1949 and the first silicon carbide was produced there in 1951.

What's in a Name? — Southern States Iron Roofing Co., a Reynolds Metals Co. subsidiary in Atlanta, Ga., has changed the firm's name to Reynolds Aluminum Supply Co. Southern States was established in Savannah, Ga., as a steel roofing fabricator. The company has since become the largest of its kind in the South, with two manufacturing plants, in Atlanta and Birmingham, and nine distribution centers.

Bauxite Down Under—Reynolds Metals Co. has formed the Reynolds Pacific Mines, Ltd., as a wholly-owned Australian subsidiary with headquarters in Melbourne. The Australian company hopes to be successful in finding and acquiring substantial bauxite deposits and other raw materials. The subsidiary company was formed with an authorized capital of 5 million pounds (Australian) or about $11,250,000.

Clear View — Pittsburgh Plate Glass Co. has awarded a general construction contract on a multi-million dollar window glass plant to be located near Decatur, Ill. General contractor will be Virginia Engineering Co. of Newport News, Va. The facility will utilize newly developed mechanical and electronic equipment in the manufacture of window or sheet glass. About 350 employes will be required to operate the new plant.

Brains for Missiles—Engineers have built a Jiggle-proof plant in St. Petersburg, Fla. to aid in man's conquest of space. The $4½ million structure was erected by Minneapolis - Honeywell Regulator Co. to develop the most advanced type of electronic "brains" yet devised for automatic guidance of missiles and rockets. New plant will be operated as part of Honeywell's Aeronautical Division.

Ready to Test—The Budd Co., Philadelphia, has purchased the Krouse Testing Machine Co. of Columbus, O. This acquisition, along with the recent establishment of the Tatnall Measuring Systems Co., now provides Budd with a complete line of testing equipment. The new subsidiary will continue under its previous management with Glen Krouse, founder, as president of the company.

Metallurgists Honored — Westinghouse Electric Corp. honored two Bettis atomic power division metallurgists with special awards of $2000 each. In a surprise ceremony, the special awards went to Dr. D. E. Thomas and Dr. K. M. Goldman for their discovery of a broad range of zirconium alloys in 1952. Original use of the alloys was in the structural parts of the Nautilus reactor and the cladding of certain components.

A Cool Contract — The Fluor Corp., Ltd., Los Angeles, will design, engineer and construct a new $25 million power plant for the California Electric Power Co. near Daggett, Calif. The facility will be known as the Cool Water Steam Plant. The plant will consist of two 60,000 kw reheat turbogenerator units.

Testing Acreage—Instron Engineering Corp., Quincy, Mass., is erecting a 25,000 sq. ft. plant in Canton, Mass. The plant is being built to meet the demands for the company's electronic testing equipment. The administrative and engineering offices will also be housed at the new location.

Lot of Pressure—A $3.5 million contract has been awarded to Blaw-Knox Co.'s Power Piping & Sprinkler Div., Pittsburgh. Order calls for power piping systems to serve four 150,000 kw steam power units for the Tennessee Valley Authority in its Johnsonville, Tenn., power plant. All fabrication and erection will be done by Blaw-Knox.

Editor Nominated—G. F. Sullivan, editor, The IRON AGE, has been nominated for the office of Secretary-treasurer of the Society of Business Magazines Editors. Other nominees are: President, C. O. Herb, editor, Machinery; First Vice President, Colin Carmichael, editor of Machine Design; Second Vice President, Frank Richter, editor of Modern Railroads.

Founders' Hard Sell—The Gray Iron Founders' Society, Cleveland, will sponsor a sales training Clinic for gray and ductile iron castings salesmen. Consisting of a 3-day series of working sessions, it will be conducted in Philadelphia, Chicago, Cleveland and possibly other cities early in 1958. Individual classes will be limited to 25 men to facilitate participation by registrants and to assure personalized instruction.

On Safari—South African Railways has purchased 45 Mainline diesel-electric locomotives from General Electric. Order totals more than $7½ million. The new units are slated for service in the Transvaal district near Johannesburg. They will be used both for passenger service and to haul coal from the mines in Natal.

Nuclear KW — The Atomic Energy Commission has awarded a contract to Kaiser Engineers, Oakland, Calif., to perform the engineering design of a natural uranium, graphite moderated, gas-cooled nuclear electric power plant. Capacity will be about 40,000 electrical kw capacity. Kaiser Engineers has retained ACF Industries, Inc., as nuclear design subcontractor.

WHY WEIRZIN®?

"It resists rust, forms easily and holds paint."

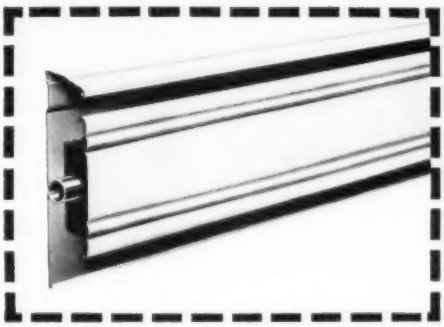
So reports the Vulcan Radiator Company, Hartford, Connecticut.

"We must bend Weirzin electrolytic zinc-coated steel like a pretzel in producing our high quality Trimline baseboard radiators. Weirzin goes right along with us—doesn't balk one bit. Our finished baseboard radiators have a constant flow of bends and turns. But in forming them, not one speck of Weirzin's protective zinc coat flakes or peels off. This assures us that recoating of our radiators is a thing of the past and that rust is a real 'goner' having no bare steel to feed upon. And, chemically treated Weirzin takes and keeps paint as if it were the natural thing to do. A decided advantage over other metals that can 'take' paint but don't hold it all."

That's Weirzin electrolytic zinc-coated steel sheets! They never give rust a start, thereby eliminating any future corrosion problem. They have a natural paint bonding surface which means the end product has a beautifully painted finish that will fit into any décor. They have the strength of their steel base which means a longer life of worry-free service.

What better characteristics could any product have to meet the exacting demands of manufacturers everywhere.

See how Weirzin can meet your requirements — better! Just write Weirton Steel Company, Dept. A-26, Weirton, West Virginia, for your free informative booklet.



WEIRTON STEEL COMPANY

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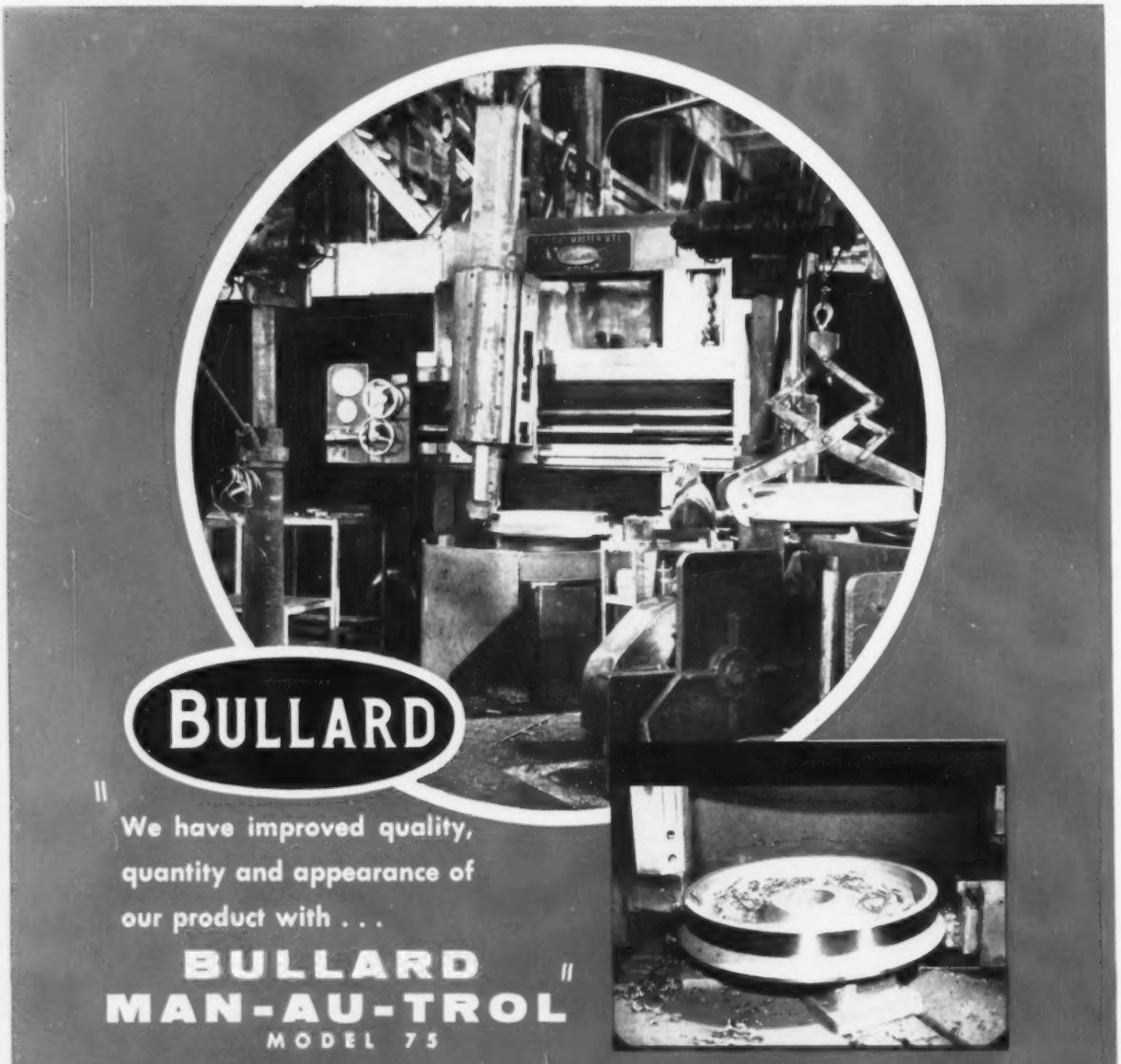

"We have improved quality, quantity and appearance of our product with . . .

BULLARD MAN-AU-TROL
MODEL 75"

This has been accomplished by one of the nation's largest manufacturers of railroad car wheels.

The plant superintendent tells us "that improved quality is obtained through greater machining accuracy – that quantity is improved with Man-Au-Trol, Model 75 since each operator can machine 76 pieces per eight hour shift compared to 40 pieces by our former method – that appearance is improved because of superior finish obtained by using single point cutting tools instead of ground formed tools."

How about you? Are you employing all the advantages offered by Bullard Man-Au-Trol, Model 75, to your machining problems.

To cut costs when cutting metal . . . buy BULLARD

Call your Bullard Sales Engineer, he's as near as your telephone or write

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BRIDGEPORT 9, CONNECTICUT

Soft water saves wives

N. J. Cornwall, Ass't Gen. Manager, Tanks, Inc., manufacturers of galvanized water softener tanks.

This man saves money making water softener tanks with Sciaky Resistance Welding Techniques

Among wives, Norm Cornwall would be rated a wife saver, but at Tanks, Inc., he's a money saver because his production is smooth and almost completely trouble-free. And his manufacturing costs are so low that customers such as SERV i SOFT can offer their water softener rental service at really competitive prices!

Why don't *you* get the facts on how Sciaky resistance welding techniques can simplify your metal parts assembly and lower your unit costs at the same time . . . just as Mr. Cornwall did!

SCIAKY

You can read the details of this application on the next page . . .

Resistance Welding Galvanized Steel

SCIAKY

HELPS PUT PROFIT
INTO MANUFACTURING

The Economy of Seam Welding Galvanized Tanks in Limited Production

Questions frequently arise as to the practicality of resistance welding galvanized steel. However, Sciaky Resistance Welding Techniques have proved it can be done safely and economically.

The effect on zinc coating

In spot or projection welding the zinc coating remains intact when the correct Sciaky techniques are employed. In seam or flash-butt welding the zinc on the outer surfaces is removed. However, the corrosion resistance is easily restored by coating the surfaces with a priming paint such as aluminum in the way Tanks, Inc., does it. The efficiency of the Sciaky resistance welding process more than offsets the extra painting operation.

Seam welding galvanized tanks

In the Franklin Park, Illinois, plant of Tanks, Inc., Ass't Gen. Manager, Norm Cornwall, has developed a simple but efficient process for joining bottoms to shells in the manufacture of galvanized tanks.

A single operator, employing Sciaky resistance welding techniques, inserts the bottom in the shell, welds it, and restores the protective coating at a rate of 55 per hour.

The manufacturing sequence

Figure 1 shows the first operation in which the operator drives the bottom into the shell with a hammer. In actual practice he performs this operation and the third operation while welding is in progress.

FIG. 1 Operator inserting tank bottom into the shell.

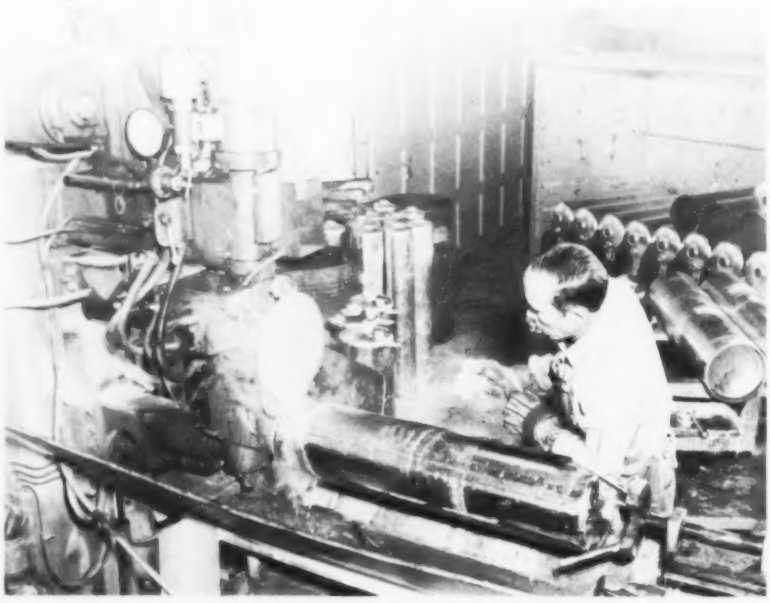


FIG. 2 Sciaky Seam Welder joins the bottom to the shell.

The second operation is the welding. The operator first makes a short (1") tack seam weld on the side of the shell opposite the longitudinal seam of the tank.

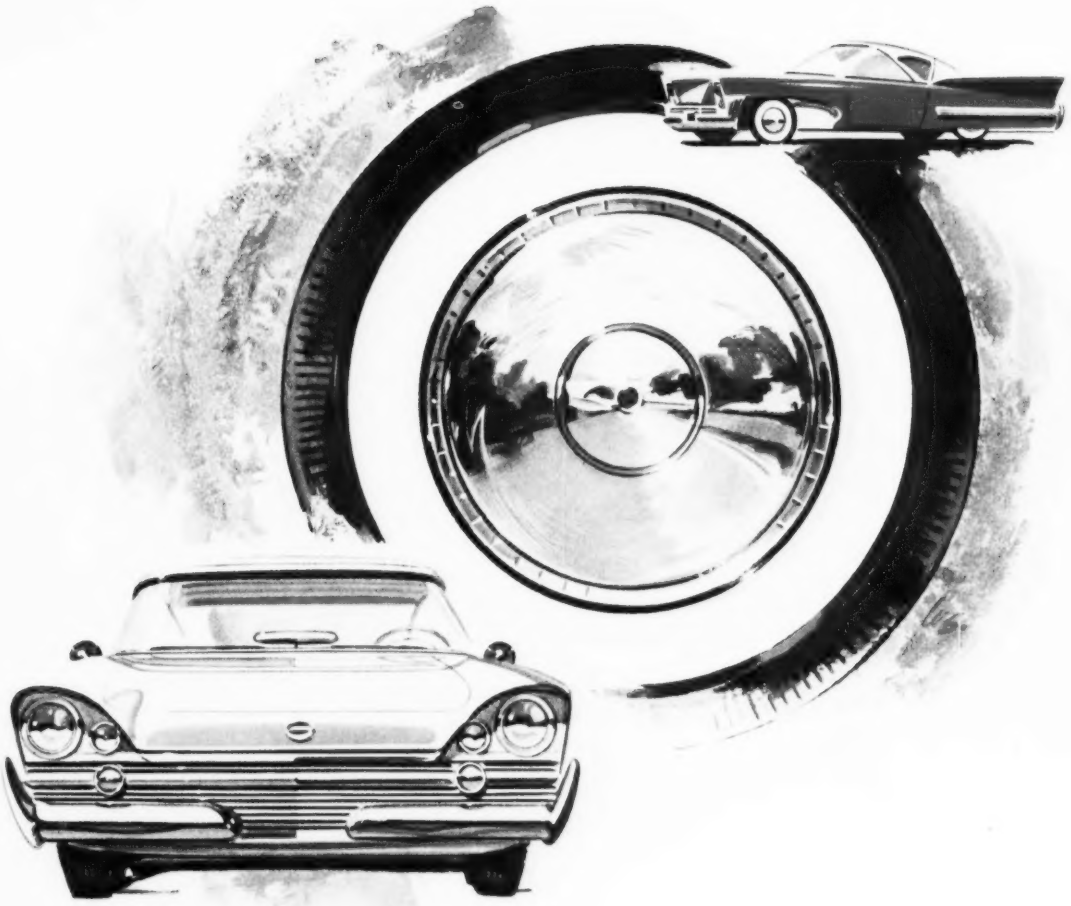
The tack welded assembly is then placed in the Sciaky welder and clamped in position by an air actuated fixture. The weld is started adjacent to the longitudinal seam of the shell and the operator helps it over this enlarged section. After this the welding proceeds unattended at a speed of 37.5" per minute with a spot spacing of 15 per inch. (See Figure 2). After completion of the full 360°, the operator allows the welder to continue and reweld over the longitudinal seam. This practice minimizes the danger of "leakers".

In the third operation the operator paints over the seam weld with aluminum paint to restore the corrosion resistance of the seam.

Information available

Case histories outlining the successful use of Sciaky Resistance Welding Techniques on galvanized material are available on request. An engineering report on resistance welding of galvanized steel is also available. Specific recommendations will be furnished on receipt of an outline of your requirements.

Write today, mentioning the information you would like to receive. There is no obligation. Sciaky Bros., Inc., 4932 W. 67th St., Chicago 38, Ill. POrtsmouth 7-5600.



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HIGH QUALITY SHEET AND STRIP

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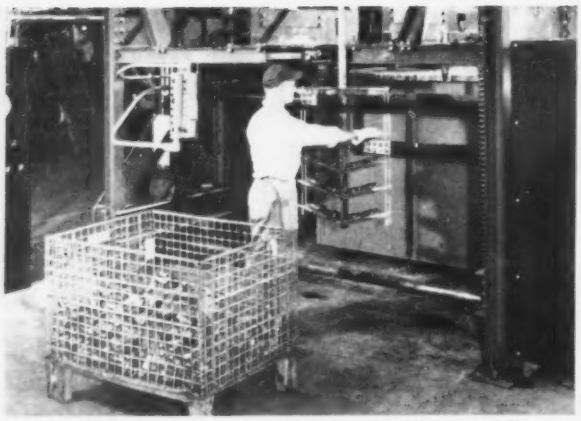
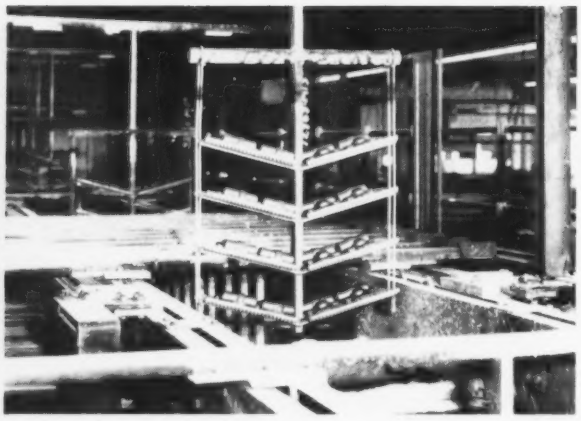
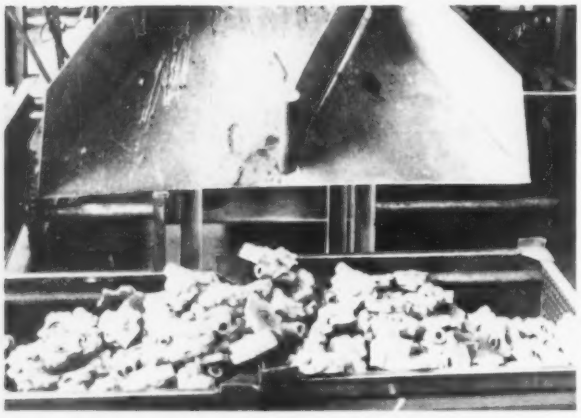
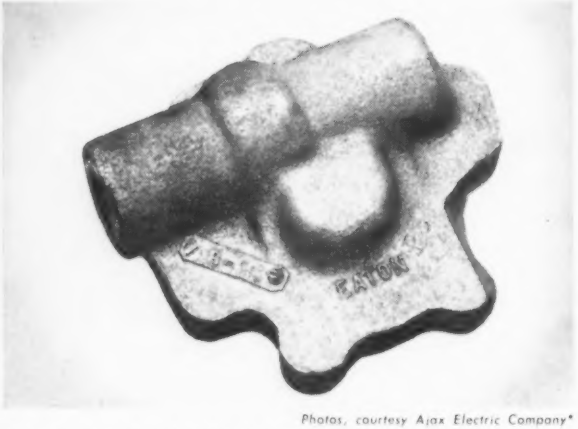




DIRTY CASTINGS COME CLEAN





*Photos, courtesy Ajax Electric Company**

CHEMICALLY CLEAN WITH VIRGO® ELECTROLYTIC SALT

How Eaton Manufacturing saves up to 75% on salt for desanding

A short dip in this new, fully mechanized furnace, and castings come up completely cleaned for the Eaton Manufacturing Company.

Inside the furnace is a new desanding salt: Virgo Electrolytic Salt—which costs as little as one-fourth as much as comparable electrolytic cleaners.

This molten salt takes just 15 to 20 minutes to clean even the hard clinging sand, scale, graphite, and other surface impurities from iron and steel castings.

Because of this speed, the new Eaton furnace can handle up to 5400 gross pounds of castings per hour, heating them to 900° F. with 274 KWH Hr. One man operates the entire furnace.

No acid dip. The Virgo Electrolytic Salt process requires no acid dip after rinsing. Of course, if other operations require it, you *can* use the acid treatment.

The bath's electrolytic action leaves all casting surfaces resistant to rust, helps *keep* them clean until further processing.

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For technical data on the salt and the process, send us the coupon.

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H. H. Bloom, elected president, J. I. Case International, S. A.; **T. A. Haller,** elected vice president, engineering, J. I. Case Co.

John Stewart, Jr., appointed acting controller, Reading Tube Corp., New York.

C. M. Albritton, named vice president, manufacturing, Huck Mfg. Co., Detroit.

DuPont Yager, named vice president, automotive sales, Reynolds Aluminum Sales Co., Detroit.

R. J. Grubba, appointed vice president, engineering and **Oren Downs,** promoted to superintendent, metal fabrication, Wettlaufer Engineering Corp.

E. E. Boyer, named district manager, Cleveland, O. district, Kennametal Inc., Latrobe, Pa.; **W. F. Gearhart,** appointed die sales coordinator; **R. M. McCray,** appointed district manager, Cincinnati.

R. E. Walsh, appointed regional vice president, Chicago area, Blaw-Knox Co., Pittsburgh.

J. E. Blomquist, becomes vice president and general manager, Great Lakes Sales Region, Reynolds Aluminum Sales Co., Detroit headquarters.

E. H. Durkee, elected secretary and treasurer, Great American Industries, Inc.

B. S. Hough, appointed midwestern district manager, The Monarch Rubber Co., Hartville, O.

Dr. P. H. Cardwell, appointed technical specialist, technical service and development, The Dow Chemical Co.

F. H. Ueckermann, named Chicago district manager, Wire Rope Div., John A. Roebling's Sons Corp.

J. A. Wentworth, appointed general manager, Ohio Div., Associated Spring Corp., Dayton, O.

S. J. Cromer, appointed vice president, engineering, Union Carbide Nuclear Co., Div. of Union Carbide Corp.

J. E. Praser, appointed general superintendent, Cleveland steel service plant, Joseph T. Ryerson & Son, Inc.

J. O. Thill, appointed Pittsburgh district manager, The H. M. Harper Co., Morton Grove, Ill.

W. W. Kearney, appointed manager, production control, The Baker-Raulang Co.

W. H. Betts, appointed staff metallurgist, The United Engineering & Foundry Co., Pittsburgh.

G. A. Waterman, named director, product sales and engineering for Olin Aluminum, Olin Mathieson Chemical Corp.

A. F. Besch, appointed sales manager, and **C. A. Beutel,** appointed asst. sales manager, The Paterson-Leitch Co.

P. C. Holland, appointed general manager, National Precision Casting Corp., Paoli, Pa., subsidiary of The Beryllium Corp., Reading, Pa.

Four key changes in The American Ship Building Co.'s engineering staff in Cleveland are as follows: **W. R. Douglas,** will become electri-

cal engineering consultant; **L. A. Dommin,** will be chief electrical engineer; **P. M. Miedlich,** will become assistant to the vice president, engineering; **H. J. Erickson,** will become chief engineer.

H. O. Kirkpatrick, appointed general manager, American Manufacturing Co.

A. M. Callis, appointed general sales manager, Federated Metals Div., American Smelting & Refining Co.

D. E. Morgan, named general traffic manager, Central Traffic Dept., Blaw-Knox Co.

William Staecker, named asst. manager, engineering, Press Div., E. W. Bliss Co.

D. W. Miller, named sales engineer, Detroit sales office, Wheelabrator Corp.; **F. H. Smith,** appointed sales engineer, Detroit territory; **W. W. Clements,** named sales and service engineer, Detroit;

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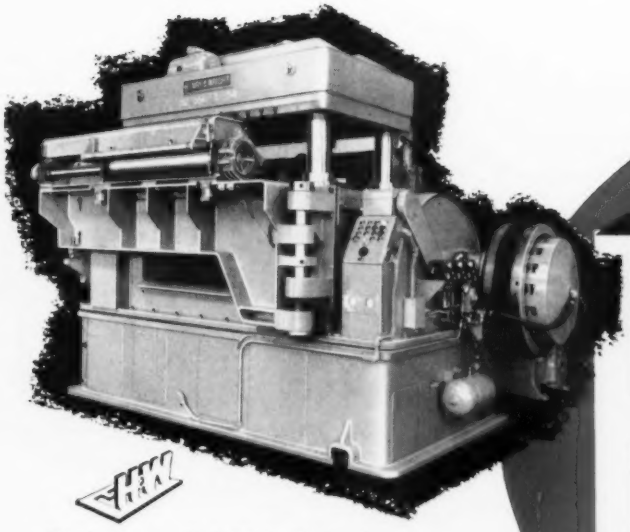
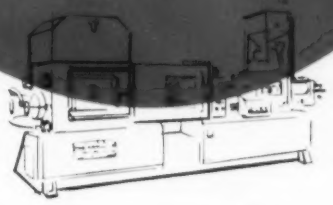
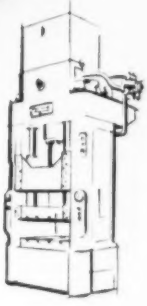
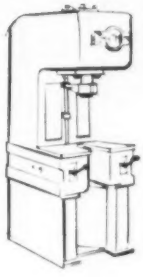
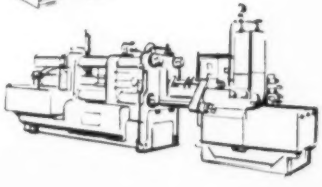


This is the new H & W Double Crank, 350 ton dieing machine which is designed to extend the economies of progressive metal stamping.









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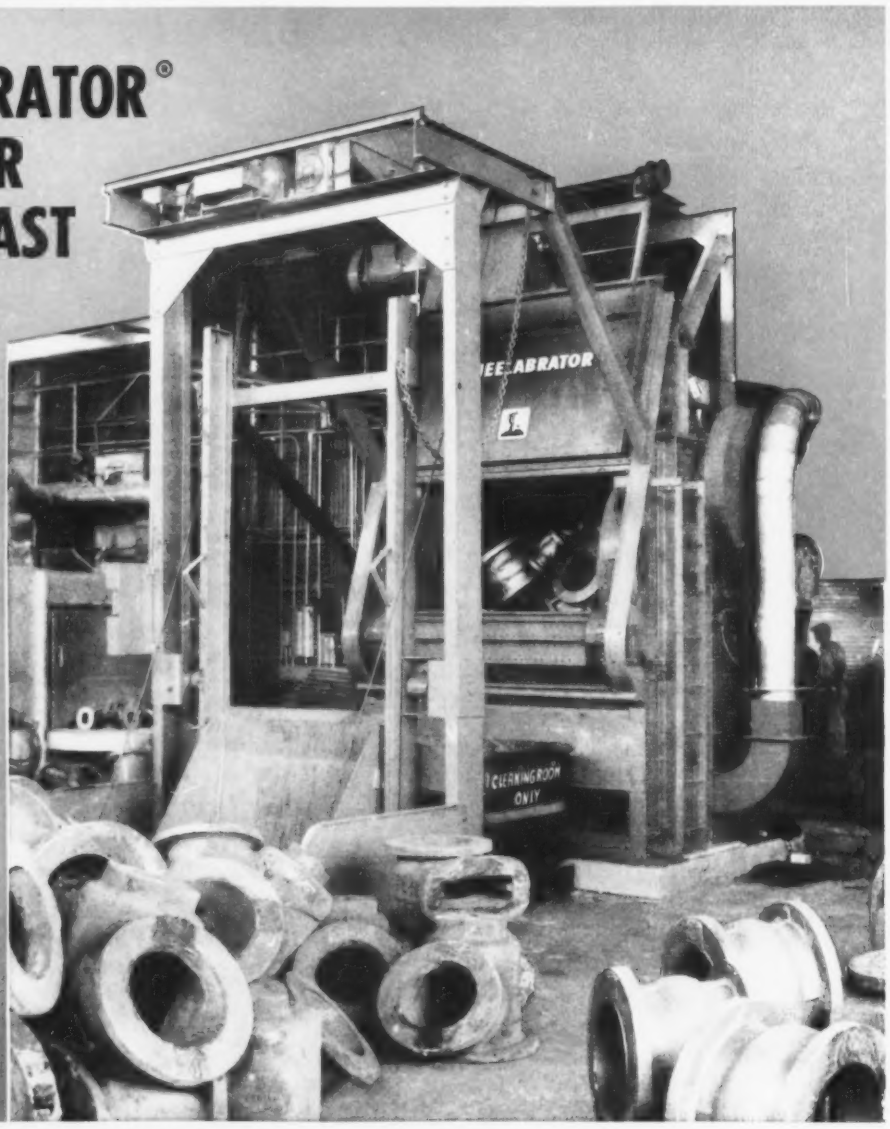

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Cleaning approximately 70 tons of steel castings per day, the Super Tumblast handles the bulk of all cleaning—about 60%—faster, more efficiently and at less cost than by previous methods. Castings cleaned range in weight up to 800 lbs. Typical loads weigh approximately 3000 pounds. In eight months time — 1618 wheel hours — maintenance required has been even lower than expected!

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Andrew Joye, appointed sales and service engineer, Detroit.

R. L. Allen, appointed general sales manager, Chicago Steel Tank Co., Div. of U. S. Industries, Inc.

Alfred Drain, named chief engineer, Canton Div., E. W. Bliss Co.

E. E. Babos, appointed sales manager, The Ohio Structural Steel Co., Newton Falls and Warren, O.

H. F. Robertson, appointed technical director, Union Carbide Development Co.

W. A. Lang, appointed marketing engineer, Hunter Spring Co., Lansdale, Pa.

J. J. Lohrman, named manager, distribution, Distribution Dept., Russell, Burdsall & Ward Bolt & Nut Co.

Following appointments are within General Electric's Locomotive and Car Equipment Dept., Erie, Pa. **F. H. Craton,** appointed manager, equipment section; **F. A. Compton, Jr.,** named manager, locomotive section; **J. U. Neill,** appointed manager, repair and renewal parts sales product section.

H. C. Kemper, appointed chief engineer, The R. K. LeBlond Machine Tool Co., Cincinnati.

J. W. Ogletree, appointed chief engineer, manufacturing, Tennessee Coal & Iron Div., U. S. Steel Corp., Birmingham, Ala.

J. P. Brown, appointed manager, West Coast operations, Grand Rapids (Mich.) Div., Lear, Inc., Santa Monica, Calif.; **J. E. McKeighan,** appointed contracts manager, Lear-Romec Div., Elyria, O.

W. W. Williams, appointed application engineer, Rockford, Ill. office, Vickers Inc.

S. E. Platz, appointed asst. chief metallurgist, The Duraloy Co., Scottdale, Pa.

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Turn down the heat! Put most of your Bonderite line heat costs back in the till! Parker Rust Proof Company has developed a new Bonderite system for low temperature operation.

It includes a new cold alkaline cleaner that works beautifully at 70° and is effective in a temperature range from 60° to 120°. A new Spra-Bonderite, specially formulated to produce a superior coating at low temperatures, has been developed to work in conjunction with the new Parker cold cleaner.

With the new cold Bonderite system, savings are really sizable. Heat consumption in the line is cut by as much as 70%. Cost of the new Parker system is approximately equal to conventional alkali cleaners and phosphate coating chemicals, so the savings in heat are practically all velvet. It is estimated that on an average automobile body line the savings in steam costs can run as high as 10 to 12 cents per body; on an average refrigerator line 4 to 5 cents per cabinet. Savings in B.T.U.s can mean savings in dollars.

The new cold Bonderite system has been production-tested in mass production plants. Its performance has amazed the experts. It's ready to go to work in your plant, saving you money, right now!

Why go on paying for heat you don't need? Start using Parker's new cold Bonderite system. A letter or phone call will bring a Parker man with full, money-saving details.

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Cladding on Carbon Steel Opens New Fields to Titanium

By R. C. Bertossa—Senior Metallurgist, Stanford Research Institute, Menlo Park, Calif.

Researchers have come up with a way to economically enjoy titanium's benefits now — even at today's prices.

Picture the possibilities for titanium-clad carbon steel — a thin, non-structural layer of the wonder metal solidly backed by low-cost plate.

▪ Titanium-clad carbon steel is a practical reality. Recent studies at Stanford Research Institute and elsewhere show it's now possible to make an integral and continuous bond between the two metals. Special adaptations of vacuum-furnace brazing produce ductile, bimetallic plates in large sizes—titanium-clad carbon steel that can be formed and welded into a variety of useful shapes and structures.

Possible applications for the material are almost as broad as industry itself. Titanium and its alloys have high resistance to corrosion by sea water and other chloride-containing media at low temperatures. These compounds readily attack even the stainless steels. And varied amounts of chlorides are present in many processes relating to the chemical, marine, petroleum, paper, and food-processing industries.

So far, titanium has generated little interest in these fields as a means of guarding against corrosion. The cost of solid titanium rules out the possibility of using it for structures or process equipment. And until now, no means has been available for applying a thin, corrosion-resistant layer of titanium to a cheap, strength-giving material like carbon steel.

Possible Reactor Uses—Beyond the process industries lie many potential applications in atomic energy. At present, the use of titanium is limited by its relatively high thermal neutron-absorption cross-

FIG. 1: Fine silver brazing foil (middle band) produces a uniform bond between A-70 titanium (at top) and low-carbon steel. Nital, $HF+HNO_3$ etch; 200x.

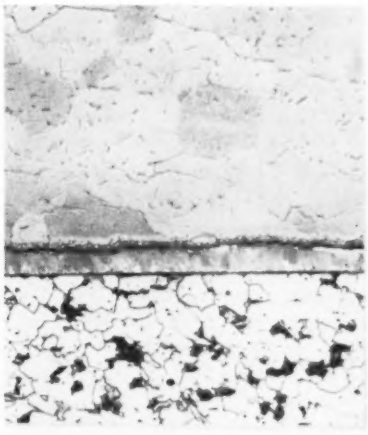


FIG. 2: Lower brazing temperature with Ag-Cu-Li alloy gives good bond and equiaxed grain structure in the titanium. Nital, $FeCl_3$, $HF+HNO_3$ etch; 200x.

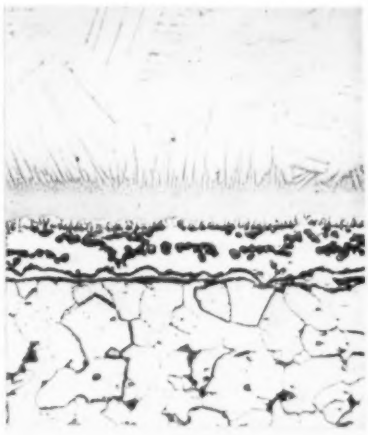
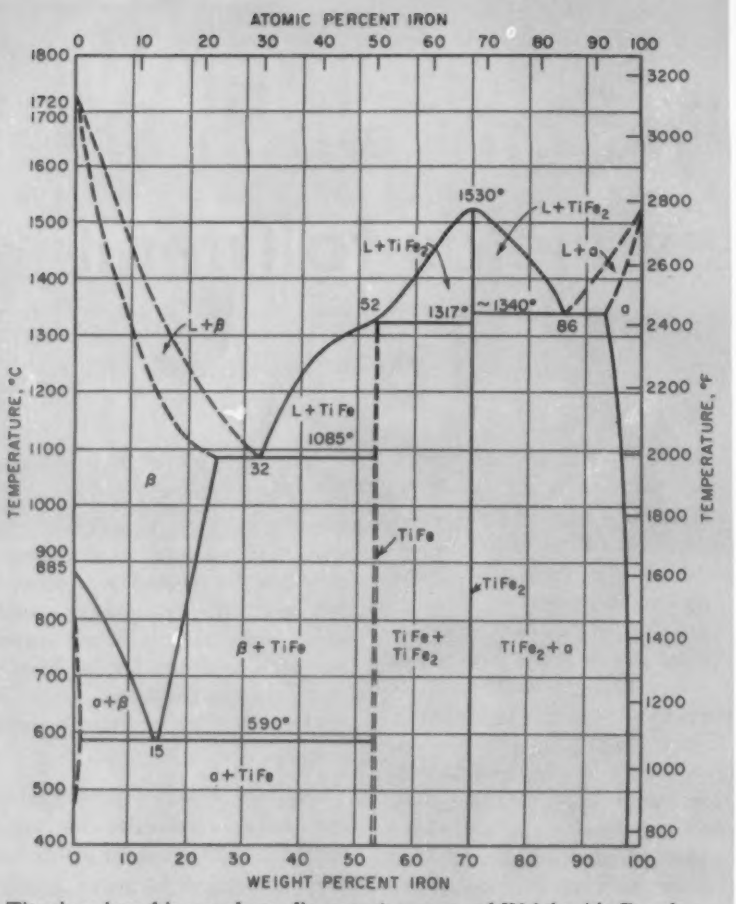


FIG. 3: Acicular, martensitic-like titanium structure similar to that in Fig. 1 again results with Ag-Mn brazing foil. Nital, $FeCl_3$, $HF+HNO_3$ etch; 200x.



Titanium-iron binary phase diagram (courtesy of Wright Air Development Center) shows solubilities of titanium in iron.

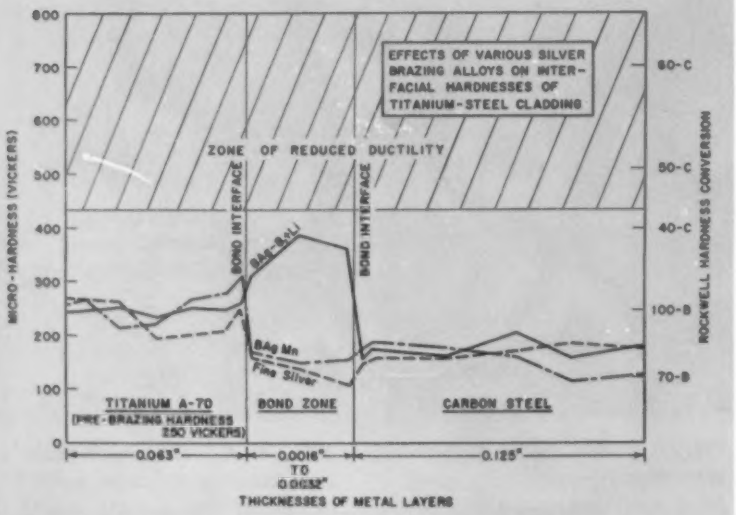


FIG. 4: Microhardness checks on cross-section of titanium-clad carbon steel plate show good ductility at interface and bond zone.

section (high, that is, in comparison with such metals as zirconium).

Irradiation of metals is, however, known to have unusual effects on their corrosion resistance. Titanium appears to have excellent corrosion resistance under reactor conditions, plus good oxidation resistance to around 700°F.

Metallurgists who developed the new cladding techniques were faced with two basic problems: One is the fact that all high-temperature heat treatments have to be made under a high degree of protection to prevent atmospheric gases from coming in contact with the titanium. Even minute quantities of gases such as oxygen, nitrogen and hydrogen can contribute to embrittlement of the metal.

Secondly, titanium reacts very readily and rapidly with many other metals and alloys, and the intermetallic compounds formed are almost always of low ductility. This closely restricts the number of brazing alloys which can be used.

Unfortunately, carbon steel is one of the metals which forms brittle intermetallic compounds with titanium. The accompanying binary titanium-iron phase diagram shows the solubilities of titanium in iron, the range in which various intermetallic compounds form, and the drastic effects iron additions can have on the melting point of titanium.

Vacuum Furnace Proves Best—Inert-gas protection (argon or helium) during the entire brazing, heating, soaking and cooling cycle will produce ductile, high-temperature brazed joints between titanium and carbon steels. But inert-gas brazing requires very high purity gas with an extremely low moisture content for satisfactory results. Although this method has been successfully used, vacuum brazing now appears most advantageous.

For one thing, there's less chance of contamination from atmospheric gases and moisture under relatively high vacuum. Moreover, high vacu-

um conditions rapidly remove adsorbed and occluded gases which are evolved from metals during high temperature brazing. This results in greater freedom from porosity in the bond and minimizes the danger of contaminating the protective atmosphere with the evolved gases.

High vacuum conditions also deoxidize some metal interfaces (carbon steel is one) at elevated temperatures, markedly increasing wettability and flow of brazing metals and/or alloys for these surfaces.

Brazing Alloys—Fine silver and some of the higher-silver alloys seem to give the least reaction and the most ductile interfacial compounds with titanium. The brazing alloys listed in Table I have been used for titanium-carbon steel joints; bond strengths range from 15,000 to 27,000 psi, and with excellent ductility.

Recently, it was found that small percentages of lithium added to silver brazing alloys result in noticeable increases in wettability and flow for certain bimetal brazed combinations. In cladding carbon steel with titanium, lithium contributes to bond soundness and continuity. Lithium-containing silver brazing alloys are now commercially available.

Figs. 1, 2 and 3 illustrate the bonds obtained between A-70 (AMS-1409) annealed titanium sheet and low carbon steel by vacuum furnace brazing with fine silver, silver-copper eutectic alloy plus lithium, and silver-manganese brazing alloys. These alloys usually range from 0.002 to 0.005 in. in thickness and are preplaced in the joint for best results.

Good Joint Without Flux—The brazed joints were made under high vacuum at temperatures ranging from 1500° to 1810°F, without brazing fluxes; yet the resulting bonds are complete, uniform and essentially free of gas cavities and other discontinuities.

Fig. 2 shows the relatively equiaxed grain structure obtained by brazing at 1500°F, which can be done with silver-copper eutectic brazing alloy with or without lithium. Figs. 1 and 3 illustrate the acicular martensitic-appearing structure that results from brazing with the higher-temperature silver-manganese alloy and fine silver. All three samples were rapidly cooled from brazing temperatures.

The titanium-iron binary phase diagram explains why these differences in microstructure occur. The specimen in Fig. 2 was brazed at 1500°F, or below the transformation temperature of titanium; therefore, it couldn't be affected structurally by rapid cooling or quenching. The other two speci-

TABLE I

Alloys for Brazing Titanium to Carbon Steel

BRAZING ALLOY	COMPOSITION, PCT				MELTING POINT (OR RANGE), °F.
	Ag	Cu	Mn	Li	
Fine Silver	99.9+				1760
B Ag - 8	72	28			1435
B Ag - 8 + Lithium	72	28		0.5	1435
B Ag - Mn	85		15		1760

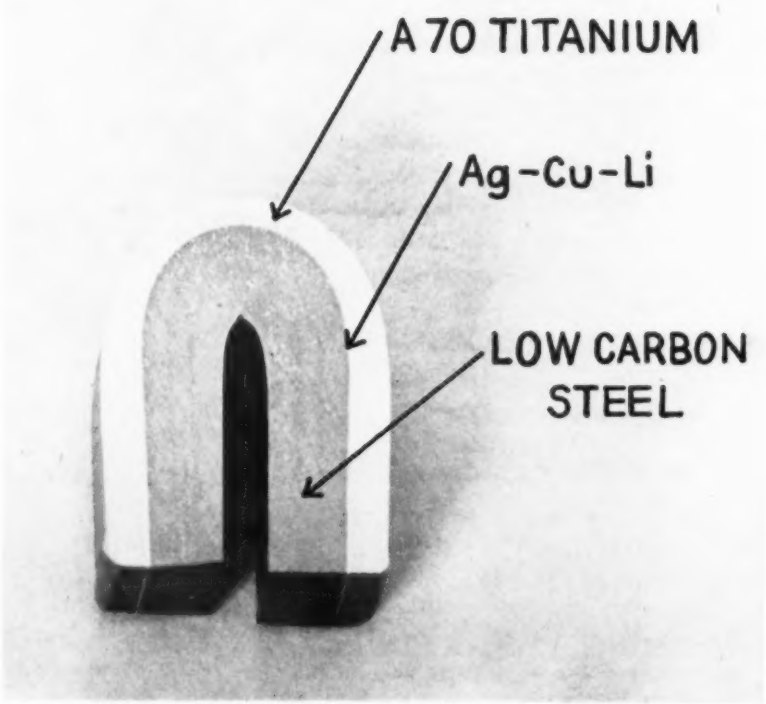


FIG. 5: Ductility is confirmed by 180-degree free bend in sample brazed with Ag-Cu-Li alloy. Outer layer is titanium. 6x.

mens, however, were both brazed in the beta range (above 1625°F).

Ductile at Interface—Results of microhardness tests on the titanium-clad layer are given in Fig. 4. There's little difference in hardness between the acicular phase and the equiaxed alpha-annealed titanium. Microhardness traverses over cross-sections of the composite clad plates are also plotted in Fig. 4. They illustrate the satisfactory ductility of the interfacial alloys and bonds.

As further evidence of ductility, Figs. 5, 6 and 7 show free bend tests made in tension and in compression. They demonstrate the ability of the vacuum-brazed silver and silver-alloy bonds to withstand high multi-directional stresses resulting from small radius bends up to 180 degrees.

How to Weld — Since titanium and carbon steels form intermetallic compounds which can be quite brittle, ordinary methods of welding dissimilar-metal clad plate materials can't be used.

The carbon steel backing plate must be thick enough to meet the design stress by itself. The titanium clad layer is permanently, completely and strongly bonded to the carbon steel base plate; but it should be used in design only as a corrosion-resistant layer and not as a stress-carrying member.

The titanium portion of the weld seam (overlay) must be applied in the form of a titanium cover strip, wider than the weld gap so that it can be inert-gas welded to the titanium layer. This weld-seals the joint without fusion between titanium and carbon steel. A trailing shield gives the titanium weld metal maximum protection against atmospheric gases while it is at elevated temperature.

Welded seams produced in this way have proved quite satisfactory.

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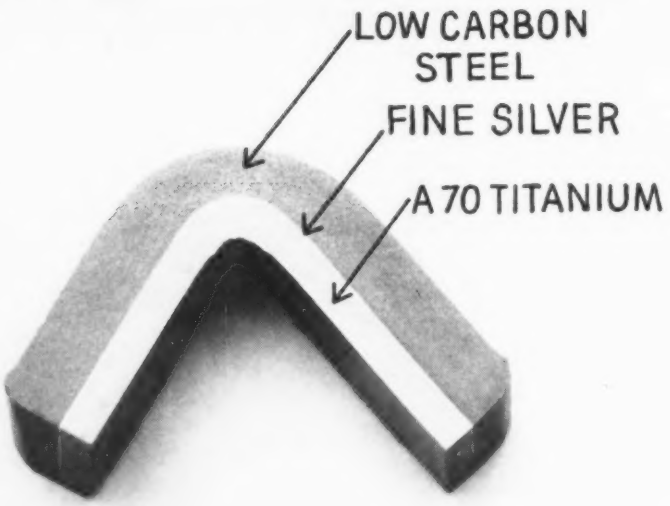


FIG. 6: Titanium-steel sample brazed with fine silver alloy is unaffected by 100-degree free bend with titanium on the inside. The bond easily withstands high multi-directional stresses of small-radius bends.

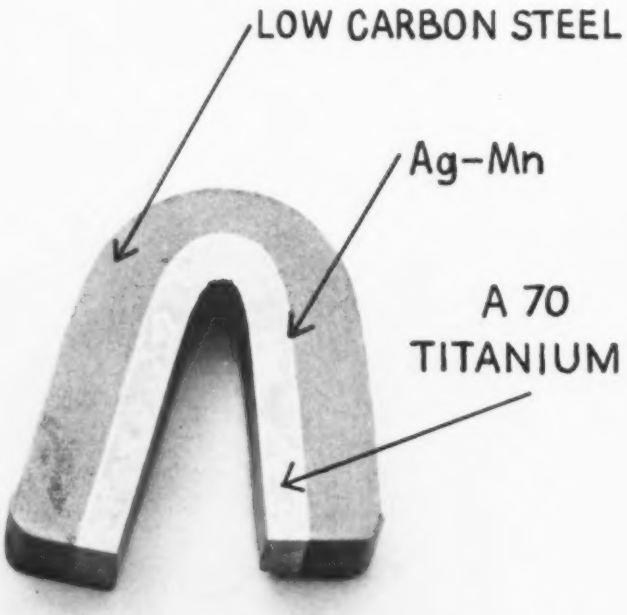


FIG. 7: Good ductility and bond are also evident after 160-degree free bend in sample joined with silver-manganese brazing alloy.

Optical Tooling: Short Cut To Accurate Alignment

By **William Czygan**—Materials Editor

Is it really straight, accurately leveled, exactly plumb and perfectly square?

There's a quick and easy way to answer these and many other measurement problems.

It's done with precision telescopes that provide a sagless reference line over long distances.

■ Days and sometimes weeks of tedious layout, setup and measurements are being reduced to hours and even minutes by an extension of the surveyor's art called optical tooling.

It's a fast and highly accurate method of alignment and positioning—a short-cut via precision optics to getting things straighter, flatter, precisely plumb and square.

Essentially, optical tooling is a system of taking accurate measurements from an unwavering line of sight—an absolutely straight reference line that stretches as far as the telescope-aided eye can see. Once established, the line of sight can be moved up, down or sideways, either parallel to the original position or swept in vertical and horizontal planes passing through it. Measurements to within a few thousandths of an inch are possible over distances of a hundred feet or more.

Finds Many Uses—Possible applications for optical tooling are almost infinite. It's widely used, for example, to align and level long machinery beds. Some Kearney-Trecker aircraft skin mills have been set in this fashion. The base of a 550-ft machine for making paper-box boards was leveled to ± 0.002 in. plate to plate; the rolls were aligned parallel to each other and set at right angles to the base line by means of an optical square accurate to within one second of arc (0.001 in. in 16 ft).

Optical tooling has proved a real boon to the aircraft industry for locating airframe parts in large jigs and fixtures. It substantially reduces costs by eliminating the need for building accurate devices into each setup; the optical tools can be moved from one jig or fixture to another, spreading the cost of accuracy over a number of operations.

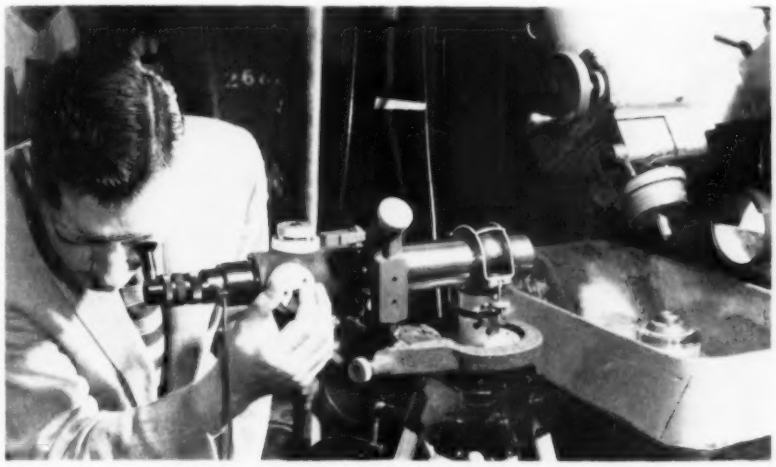
Utility companies use the system for aligning shaft bearings on large turbines. Once aligned, they're given running checks while the turbines are operating.

Large Work and Small—A manufacturer of TV broadcasting towers applied optical tooling to the problem of keeping ends of prefabricated sections exactly parallel so the assembled tower will be plumb. It provides eight times greater accuracy than conventional methods and cuts jig setup time 75 pct.

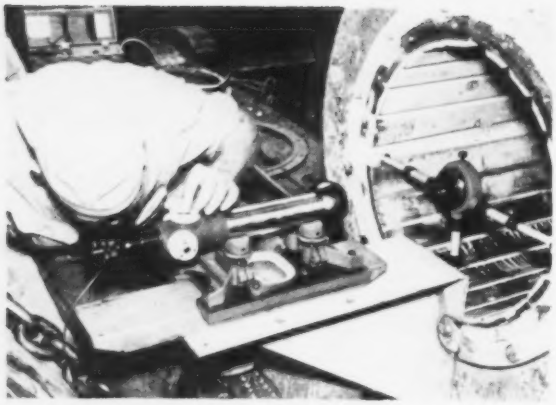
Optical tooling makes for longer machine and tool life through better alignment of bearings, spindles, drive assemblies, moving parts and beds. Angular and linear tolerances can be more closely controlled both in setup and in production, without costly gages and fixtures.

What's Needed — The amount and type of equipment necessary will depend on what kind of measurements have to be made. Basic instruments for optical tooling are an alignment telescope, optical square, jig transit, optical level, and precision targets or scales. Where long linear measurements must be controlled, tapes accurate to better than 0.005 in. in 100 ft are used (they're available up to 300 ft long).

Permanent reference lines are



PRECISION LINEUP: Alignment telescope equipped for auto-collimation accurately locates cross-feed shaft in relation to spindle on an Elgin-Desenberg curve generator. Optics are now being used for positioning components, beds and ways on many types of machines.



CUTS VIBRATION: Maryland Shipbuilding & Drydock Co. uses a K&E telescope for accurately aligning stern tubes, shafts and strut bearings on ships.

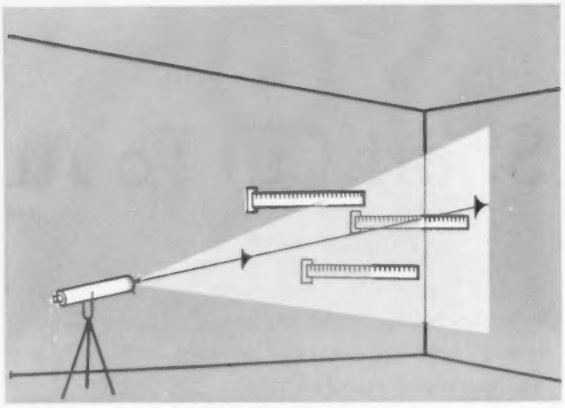


FIG. 1: Jig transit establishes a precise vertical plane of sight, determines within a few thousandths of an inch if even the longest line is plumb.

provided by the alignment telescope; the optical square or the jig transit establishes a vertical plane exactly where required, as in Fig. 1, and the precise level sets up a horizontal plane as in Fig. 2 at any desired height.

It's possible to start with a few hundred dollars' worth of equipment for simple jobs, as well as to make five-figure investments to handle complex work. For instance, Keuffel & Esser Co. offers an outfit for precision leveling at only $770.

Targets and Scales—Targets come in four types: alignment targets, which give a point of reference; a displacement target, which does the same thing but also has horizontal and vertical scales for measuring displacements from the line of sight up to 0.3 in.; auto-reflection targets, for aligning objects by reflecting an image back along the line of sight; and a mirror target, for controlling the tilt of a part on which it's mounted.

Extremely accurate measuring scales are needed for optical tooling. K&E has developed a new type made of hardened tool steel coated with a white plastic matte finish. Graduations are in tenths of an inch, positioned to within ±0.001 in. at 68°F.

How It Works—A simple illustration of how some of these items are put to use is the method for leveling a surface plate. This is done with a tilting level and scales.

The tilting level, a precision telescope with a screw-leveled base, is first mounted on a tripod or instrument stand and set up at a convenient distance from the work. Next, the instrument is leveled by adjusting the base screws until a circular bubble is centered.

At this point, targets in the form of vertical scales are placed on opposite corners of the surface plate, as in Fig. 3.

Now a line of sight is established by focusing on one of the scales. Then the line of sight is leveled by turning a tilting wheel until the instrument's main bubble is centered.

Magic Eye—This is a coincidence bubble—a system of optical parts by which both ends of the bubble are seen side by side in a small window. As the tilting wheel is turned, the bubble-ends move with respect to each other; when they exactly match, the line of sight is level. The coincidence bubble is extremely accurate—a tilt of just one second of arc (about 0.0015 in. at 25 ft) is plainly visible.

After a reading is taken the instrument is swept horizontally to the other scale. Again, the coincidence is set. And finally, the difference between readings on the two scales—to thousandths of an inch—is the amount one corner of the surface plate must be raised to level it. When the operations are repeated on the other two corners and at intermediate points on its surface, the entire plate will be level. The same procedure is used for leveling long machinery beds.

For Close Measurement — Extreme accuracy is obtained by equipping the instrument with an optical micrometer. This device contains a disc of optical glass with flat parallel faces, arranged so that it can be precisely tiletd by turning a graduated drum. When the plate is tilted, the line of sight moves parallel to itself. Graduations on the drum record the shift in thousandths of an inch.

Other instruments are brought into play for different types of measurement. Say, for example, the problem is one of quickly, accurately and economically positioning a number of parts in a large jig or structure. A target is mounted at one end, and an alignment telescope at the other. When the cross-hairs of the telescope are brought on the target, the optical reference line is established. The line of sight can then be picked up with targets placed at any station in between.

First, a collimator (a type of aligning tube with targets at both ends) is mounted at the desired point of alignment on the part. A shop level is also fixed to the part, perpendicular to the line of sight. The part is then placed at the cor-

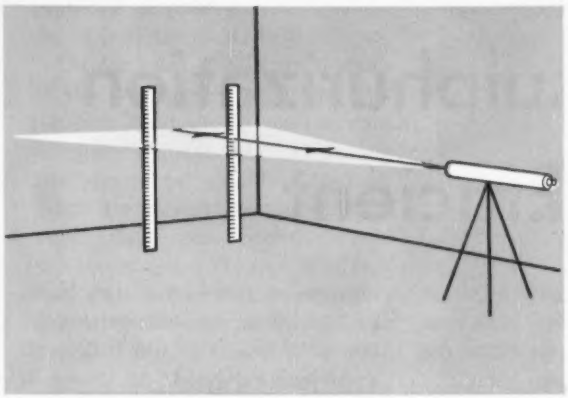


FIG. 2: Wide horizontal plane of sight is used for leveling work and for measuring flatness. It provides high accuracy on even the largest surfaces.

FIG. 3: Setup for leveling a surface plate with a K&E tilting level. The instrument helps make 16-ft bar gages accurate all over to 0.0005 in.

rect station and moved up, down, sideways or tilted until the two targets in the collimator line up with the telescope cross-hairs, and the shop-level bubble is centered.

Reflected Image — For greater angular accuracy, a technique called auto-reflection is used. This consists of mounting an optically flat target mirror with its reflecting surface parallel to the proper reference plane on the part. Next, if the telescope isn't equipped with a built-in auto-reflection target on the inside surface of the objective lens, a target is mounted on the end of it.

Then the part is placed so that the target mirror is in the line of sight of the alignment telescope; and finally, it's positioned by turning and tilting it until the cross-lines of the scope exactly coincide with the image of the auto-reflection target reflected by the target mirror.

Still greater accuracy is achieved by auto-collimation. In auto-reflection, the line of sight is aimed at the reflection of a target. In auto-collimation it's aimed at the reflected cross-lines of the telescope itself. This is done by lighting the cross-lines with an illumination unit built into the telescope's eyepiece.

King-Size Square—The ideal way to check squareness of one part to another is by using an alignment telescope equipped with an optical square. Right-angle accuracy is better than one second of arc, built right into the instrument by means of a unique optical device known as a pentaprism. It's also the fastest and most accurate way of providing precise vertical planes square to any established line.

An alternate method of squaring is with the jig transit. This is done by means of auto-reflection, with an optically flat mirror screwed onto one end of the jig transit telescope's axle, as in Fig. 4.

The jig transit is set up so that its mirror is roughly centered with the line of sight of the alignment telescope. Then the jig transit is turned about its vertical axis until the reflection of the alignment scope's auto-reflection target appears centered on the cross-hairs. The vertical plane of the jig transit will then be perpendicular to the optical line of sight of the alignment telescope.

Many variations on these basic techniques are possible. Together with numerous other accessories, they make optical tooling and alignment a highly versatile system of measurement; one that's only begun to realize a small measure of its ultimate potential.

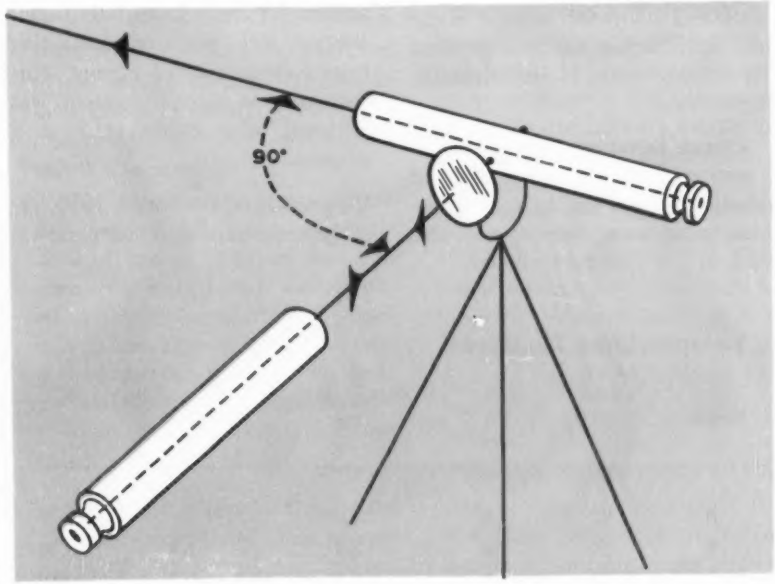


FIG. 4: Mirror on axle of jig transit reflects cross-hair image back to alignment scope, sets vertical plane 90° from base line.

■ Better Steelmaking: **No. 2 of a Series**

Lime Powder Desulphurization Proves Practical, Efficient

When pig iron is blown with lime powder, sulphur content is reduced to a very low level.

What are the advantages of this new method of external desulphurization? What is its future potential?

■ In at least one respect, the external desulphurization of blast furnace metal is fairly old business. Methods for its accomplishment were proposed at least 20 years ago. Still, the advantages of desulphurization are sufficiently attractive to stimulate continuing research.

What are these advantages?

From the metallurgical standpoint, hot metal with a very low sulphur content is highly desirable. Add to this the fact that external desulphurization increases the output of pig iron and lowers coke consumption in blast furnace operation. Finally, low sulphur in the iron helps reduce the time required for refining metal in the steelmaking furnaces.

French Development—There are a number of ways in which external desulphurization can be achieved—some good, some questionable. But the fact that new desulphurization processes are announced from time to time is a sure indication that the research ball never stops rolling.

The lime powder desulphurization process—a French development—is exceptional largely because it combines efficiency with practicality. It does the job of desulphurizing and does it well.

Pilot Plant Tested—Essentially, the new process consists of blowing pig iron with a suspension of powdered lime either in air or in nitrogen. Preliminary research was run on 600-lb heats at the laboratories of IRSID (Institut de Recherches de la Siderurgie). Later, the scope of the work was expanded to the pilot plant stage, using a 2½-ton ladle.

The pilot plant results were very encouraging from the standpoints of both costs and process feasibility. Experiments showed that it was possible to obtain a final sulphur content of less than 0.010 pct, starting with pig iron containing from 0.10 to 0.30 pct sulphur. This reduction in sulphur content was achieved in a matter of 3 to 5 minutes.

Special Ladle—During 1956, arrangements were made for conducting proving trials on 12-ton heats. In these tests, the container for the hot metal was a 15-ton ladle with a semi-conical hood. As shown in the diagram, the bottom of the ladle is fitted with four tuyeres. The ladle itself is lined with ordinary aluminosilicate brick.

About 12 tons of metal are used, and the duration of blow is limited to 5 minutes. The lime concentration in nitrogen is usually adjusted to about 0.5 lb per cu ft. The gas flow is adjusted at about 120 cfm.

Lime Is Blown—The lime powder is fluidized in a separate vessel. A maximum gas pressure of 60 psi is used.

At the start of a blow, the partially hooded ladle is tilted to a horizontal position and filled with approximately 12 tons of liquid metal. Slag is removed by hand rabbling through the unhooded portion of the ladle. The blowing equipment is then connected by hose to the base of the ladle.

Next, the gas and lime supply is turned on and the ladle is tilted to the vertical position. Blowing is continued for 5 minutes. Blowing for a longer time tends to chill the metal and promote skull formation.

Typical Results—Very little fuming is evolved during the blowing period. When the five minutes are up, the ladle is returned to the horizontal position. The gas and lime supply is turned off. The layer of scum covering the liquid metal is removed by hand rabbling.

Typical results obtained from a trial run show that the metal temperature drops about 30 F from the initial temperature (2260 F) during the blowing cycle. In this same

Sample Lime Analyses

Sample	CaO, pct	SiO_2, pct	$Fe_2O_3 + Al_2O_3$, pct	$CO_2 + H_2O$, pct	S, pct
A	93	1.2	1.3	3	0.07
B	96	0.9	1.0	1.8	0.09
C	95	0.7	1.4	1.7	0.10
D	89	2.4	2.1	3.2	0.13

heat, the sulphur content was reduced from 0.110 pct to 0.028 pct.

On the basis of experimentation, IRSID engineers established that the lime used should meet certain particular requirements. Its particle size should be roughly 0.020 in. diam. To prevent the formation of liquid slag, silica content should not exceed 5 pct. To minimize heat loss, total carbon dioxide and water content should not run higher than 5 pct.

Temperature Helps — Increased iron temperatures promote greater efficiency in sulphur removal. For example, when the metal temperature is about 2370 F, it is relatively easy to obtain a final sulphur content of less than 0.003 pct.

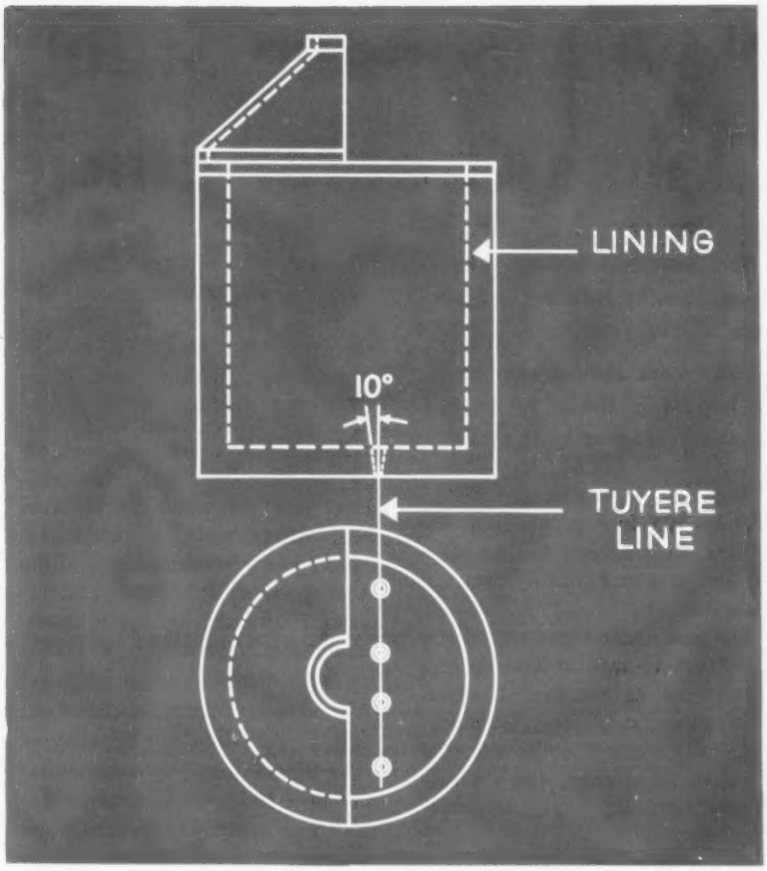
To reduce oxides in the metal, special additives such as carbon, aluminum, magnesium, and calcium were tried. Of these, only aluminum additions gave promising results.

Air may be substituted for nitrogen as the lime carrier. In this case, it is difficult to reduce final sulphur content to below 0.010 pct—particularly when iron temperature is less than 2280 F.

Why Air?—At first glance, the use of compressed air as lime carrier seems contrary to the notion of promoting an essentially non-oxidizing condition in the converter. Surprisingly enough, the amount of oxygen supplied is insignificant when compared to lime concentration.

Oxygen has a strong affinity for silicon and forms SiO_2. It doesn't appear to interfere with sulphur removal. At worst, compressed air will slightly reduce the silicon content in the final metal and will not lower metal temperature.

As a compromise designed to lower costs, air may be used during the first two to three minutes of the blow. The cycle may then be completed by blowing with nitrogen. When air and nitrogen are used in this way, it is possible to lower sulphur content to about 0.004 pct without difficulty.



FOUR TUYERES: Gas and lime powder are blown in through ladle bottom.

Tuyeres Are Best—Can an ordinary lance be substituted for the tuyeres for blowing gas and lime through the metal? The French researchers are definitely in favor of the use of tuyeres. In answer to a direct question regarding his preference, an IRSID metallurgist had this to say:

"The use of tuyeres gives a great improvement with far better conditions of contact between lime and iron. We started with lances, but we could not get results good enough for a short treatment time and we abandoned them. We made a model study of the two processes, showing that tuyeres give much better conditions of contact."

Production Planned—Despite the promise it offers, the lime process is not without some disadvantages. Perhaps its most unattractive feature is that it does require additional capital equipment. It also involves the additional handling of hot metal.

With the help of IRSID engineers, one French steel plant is now setting up equipment to apply the process on a 1000-ton-per-day scale. This installation will be fully mechanized and streamlined in every detail.

Acknowledgment — The IRSID report referred to in this article was prepared by Messrs. Trentini, Wahl, and Allard and appeared in REVUE DE METALLURGIE, Paris, May 1956.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

New Magnetic Steel Claims Greater Efficiency

The steel that actually allows magnetism to turn around corners is now a reality.

Lot's more than a neat trick, its impact is likely to be felt wherever electricity is used.

▪ A new "four-way" magnetic steel provides an answer to both improving the efficiency and simplifying the construction of electrical apparatus.

The new material actually allows magnetism to turn around corners because of its unusual structure. Referred to as a steel (although, technically, it isn't), the material is a silicon-iron sheet with a metallurgical structure that is cube-oriented.

As is the case with many electrical materials, crystallographic orientation is a key property. Thanks to its orientation, this new steel requires less energy to achieve magnetization and markedly reduces core losses. Its electrical properties are ideal for use in transformers, motors, and many other electrical devices.

Jointly Sponsored — Credit for the development of the new material and the metallurgical processes which make it possible is shared jointly by researchers of the Westinghouse Research Laboratories, Pittsburgh, and the Vacuumschmelze Division of Siemens-Halske, Germany.

The research program started out with a basic, single-phase alloy of 3 pct silicon-iron. This material has a number of known advantages that include a saturation magnetization close to that of pure iron and a high electrical resistivity.

In addition to these inherent properties, however, the problem was to develop a material with controlled impurities, a minimum of internal stresses, and controlled crystal size and orientation.

Compare Structures — To grasp the significance of the new material's cube-oriented structure, it is necessary to compare this ideal structure with two other types of structures common to magnetic materials: random oriented and singly-oriented.

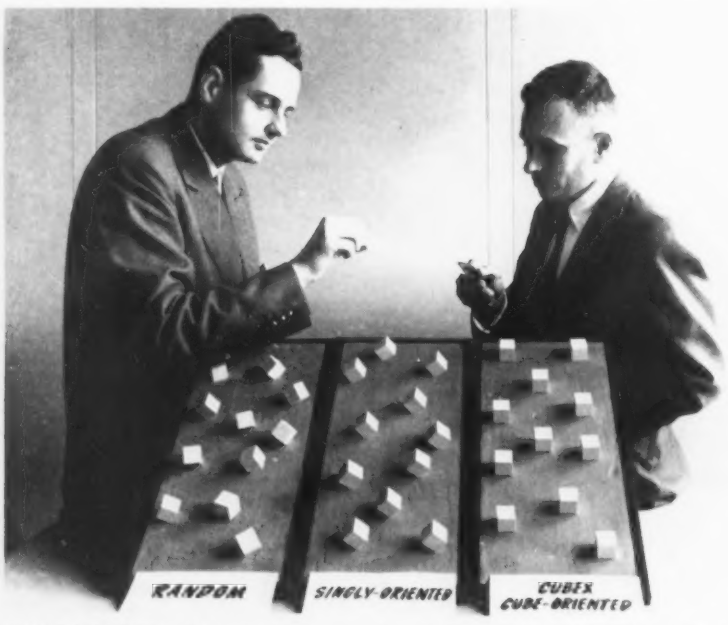
Simplifying a rather complicated concept, the researchers liken the random structure to a "bag of blocks that has been thoroughly shaken." Associated with hot-rolled, silicon steel sheets, this random structure does not permit orientation of an applied magnetic field so that it is always parallel to a cube face.

That, essentially, is characteristic of a random structure. It also accounts for the structure's relatively low electrical efficiency.

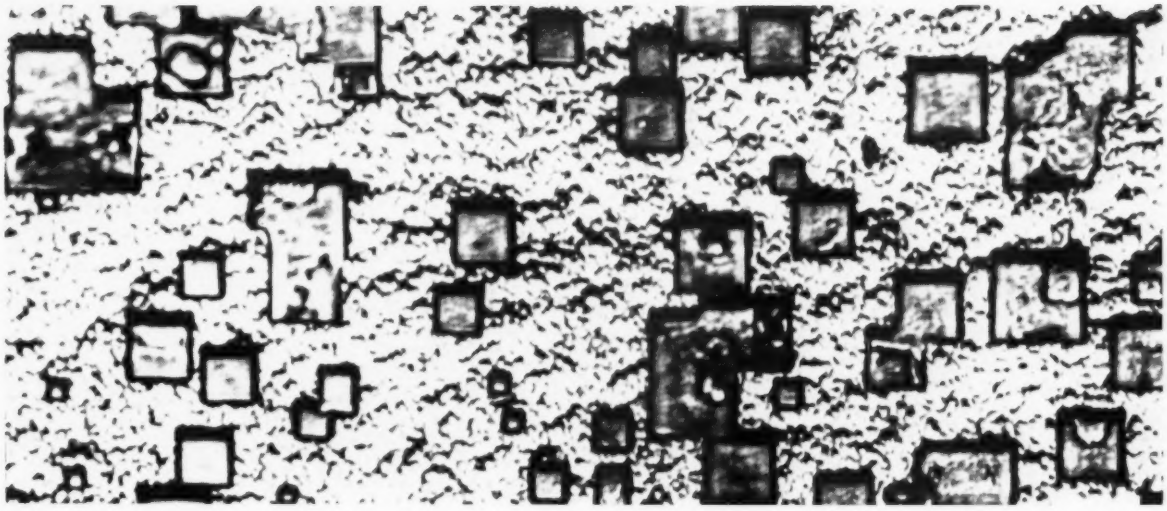
Easy Way — Better by far is a singly-oriented steel. With this structure, the individual crystals (cubes) stand on edge. Thus an easy direction of magnetization is achieved along one direction of the sheet.

Cube-type orientation may be compared to a tray of ice cubes. Each cube is neatly arranged in rows that run both vertically and horizontally. With this arrangement, easy directions of magnetization are parallel to the length, width, and height of the strip.

Coming closest to the ideal, this arrangement is most efficient and actually allows the magnetic flux to turn corners. But it isn't the cube orientation normally found in iron. It has to be made to order. That's why special metallurgical processes had to be found in order to accomplish the desired result.



DEVELOPERS: Examining a sample of the new "cube oriented" steel strip are Dr. Klaus Detert (left) of Siemens-Halske Vacuumschmelze, Germany, and Dr. G. W. Wiener of Westinghouse Research Laboratories.



IMPORTANT STRUCTURE: Cavities etched into the surface of the new electrical steel are proof of its "cube-orientation." New material is single-phase (ferrite) and can be magnetized in four directions.

Real Significance — What does the new material mean to the electrical industry? While its virtues may not be readily obvious to the layman, they are very real. According to Dr. Clarence Zener, director of Westinghouse research: "A core of magnetic steel is the unseen and rather undramatic heart of almost every piece of electrical apparatus. The average person, perhaps, is unaware of its vital role in the generation, distribution, and use of electric power.

"Yet, the kind of material from which a magnetic core is made has a direct effect upon every consumer of electricity. Over the years, improvements in magnetic steels have consistently raised the efficiency of transformers and other electrical apparatus. This has lowered losses, conserved power, and reduced the total electric bill of the nation by millions of dollars annually."

More Progress—Reviewing the gradual development of electrical steels, Dr. Zener noted that the first true magnetic steel was introduced at the turn of the century. "Then came singly-oriented silicon-iron, called Hipersil, which was developed and pioneered by Westinghouse and the American Rolling Mill Co. in the 1930's."

This type of steel, incidentally, still remains the best core material in large-scale use today. Although an accurate estimate is not available, it is assumed that the new cube oriented steel will not be available in mass production quantities for at least two or three years.

Commercially Feasible—Dr. G. W. Weiner, who is in charge of the research program at Westinghouse, indicates that the "process responsible for producing cube-oriented material has been shown to be operative in sheets thick enough to make it feasible for use in large transformers and motors." Sample lots made at the Westinghouse metals development plant measured 0.005 in. thick—the thickness used in airborne transformers, relay cores, and similar equipment.

Details of the manufacturing process responsible for producing cube-oriented sheet are not available at the present time.

Rolling Helps — However, it is permissible to state that the orientation is achieved by a combination of heating and rolling. In other words, the mechanical "working" that can be achieved in rolling is an important part of the process. In this respect, it has something in common with singly-oriented sheet. How the "four-way" effect is ultimately gained remains a secret.

The German portion of the research program was handled by Drs. Assmus and Detert.

Magnetic Properties of Singly-Oriented and Cube-Oriented Material

INDUCTION (GAUSSES)	SINGLY-ORIENTED MAGNETIZING FORCE (OERSTEDS)	CUBE-ORIENTED MAGNETIZING FORCE (OERSTEDS)
2500	0.50	0.15
5000	0.64	0.20
7500	0.83	0.33
10,000	1.20	0.55
12,000	2.45	1.00
14,000	10.75	1.75
COERCIVE FORCE (OERSTEDS)	0.40	0.175

Feeder Positions Screws For Assembly

When the screw has a head, it's easy to feed a mechanized screwdriver.

What about the socket set screw that has no head?

It takes a special unit to detect the socket end and face the screw in the right direction.

▪ It's been possible to use asymetrical fasteners, such as metal screws, cap screws, in automatic assembly operations. But a machine to automatically drive socket set screws has had to wait for the development of a means to face the screw in the correct direction.

The answer is in a new machine which feeds and drives standard, unmodified socket set screws. Designed by The Bristol Co., Waterbury, Conn., it drives screws in diameters down to No. 2 wire size and up to 5/8-in. diam, with lengths down to and shorter than the diameter.

AUTOMATIC SELECTION: Mechanical probe "feels" end of screws to send screws to bit with point end down.

The feeder unit is mounted on a modified Detroit Power Screwdriver. The mechanical rotating type hopper is powered by a 1/12 hp motor.

Key In Selector Unit—The hopper feeds screws at random through a tube to the selector unit. After the selector receives the screw it indexes about 30° to a point above the feed tube leading to the driver bit.

A metal probe "feels" the end of the screw to determine which end is up. If the probe strikes solid metal, indicating the point end, the selector rotates 180°, dropping the screw into the feed tube with the point end down.

If the probe detects the hollow socket, the screw is dropped directly without further positioning. The selector then returns to its original position to receive the next screw.

Parts Determine Rate—The selector can operate faster than screws can be driven. The limiting factor is the rate of presentation of parts to the machine.

With screws in sizes such as No. 10 x 1/4 or 1/4 x 5/16 in., the average rate for feeding and inserting the screws flush in a tapped hole is 1800 per hour.

Typical applications for the machine lie in assembly and subassembly where a ring or knob is fastened to a shaft, or in pulleys, sheaves, gears and locking rings.

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Welding Method May Reduce Inspection Time, Costs

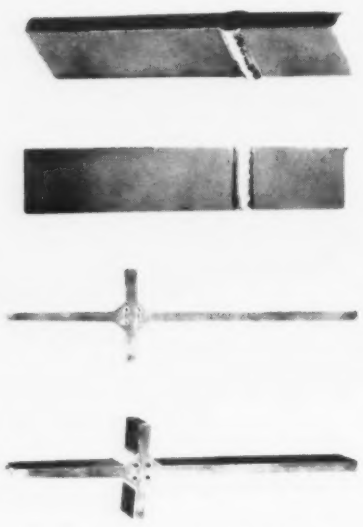
Measuring porosity in welds often requires elaborate, expensive equipment. Sometimes testing and inspecting the welds cost more than making the joint itself.

Now, a new cost cutting method comes along that could eliminate the need for much inspection now required.

▪ A recently completed research project offers some ideas on reducing the cost of weld inspection. Testing and inspecting welds often is required by code to be done with elaborate equipment. It frequently equals, even sometimes exceeds, the cost of making the weld.

With such facts in mind, researchers of the Welding Engineering Dept. of Ohio State University, Columbus, Ohio, have come up with some cost-cutting techniques. If used, these might eliminate much inspection now required to locate and measure porosity in welds, the researchers believe.

Test Weld Strength—A series of tensile, bend and impact tests were made on butt welds in ½-in. thick mild steel. Welds were made under controlled conditions with automatic submerged arc and inert gas processes so as to create porosity in welds. These tests showed that the welds could contain porosity



Holes drilled through fillet, butt welds show weld strength.

amounting to total volume to a void equal to 7 pct of the cross section of the weld without materially changing the tensile or impact strength and ductility of the welds.

Tests were all made on welds machined flat from the ½-in. thickness of the plate. Since most welds are made with a build-up that increases the cross section of the weld, the 7 pct figure will actually be larger for welds made with normal procedures. The shape and distribution pattern of the porosity had little or no effect on the test results.

A small amount of porosity is generally accepted by current inspection standards. However, since the results of the tests show that up to 7 pct reduction of the cross section has little or no effect on weld strength, university researchers believe a re-evaluation of inspection standards might be a good idea.

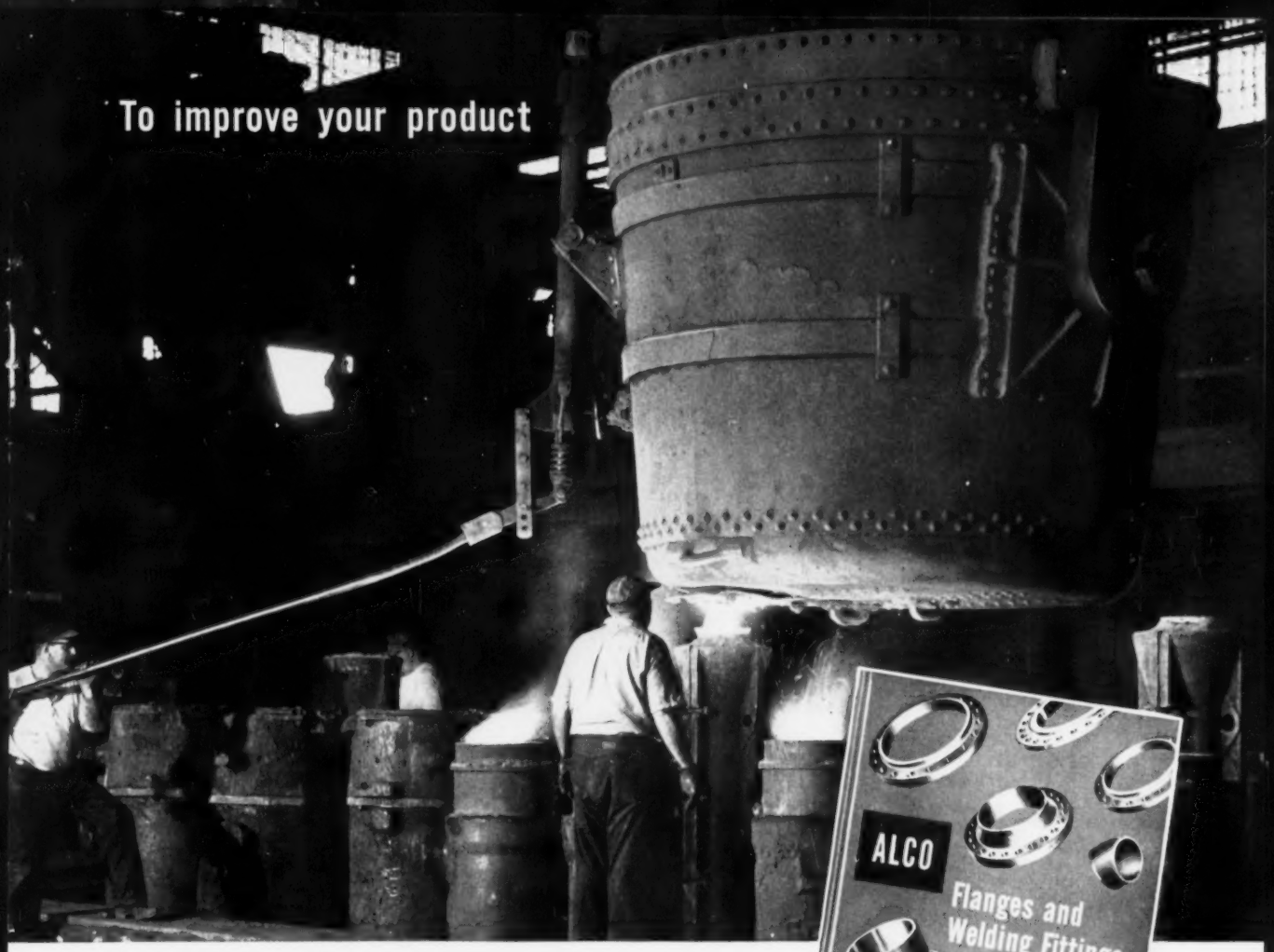
Reactor Goes Critical

The nation's largest and most advanced nuclear test facility is now in operation.

Located at the National Reactor Testing Station in southern Idaho, the reactor provides the highest known neutron flux and largest known test spaces within an enriched uranium core where scientists and engineers can determine the effects of intense neutron and gamma ray bombardment on material components.

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 85. Just indicate the page on which it appears. Be sure to note exactly the information wanted.



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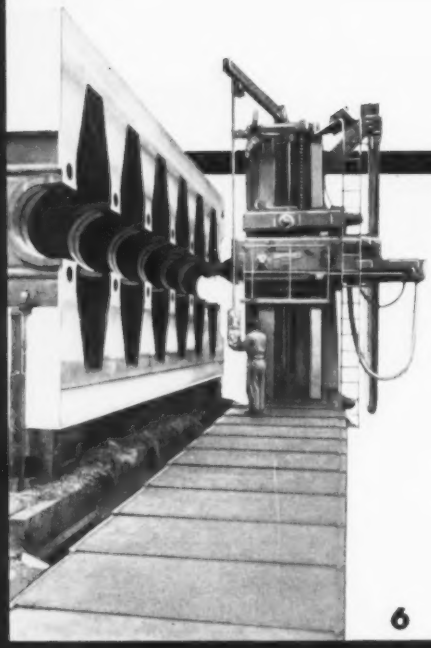

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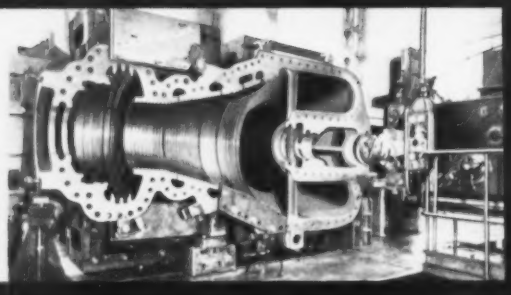

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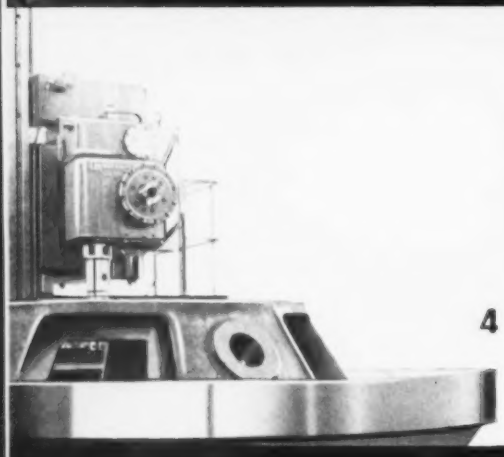

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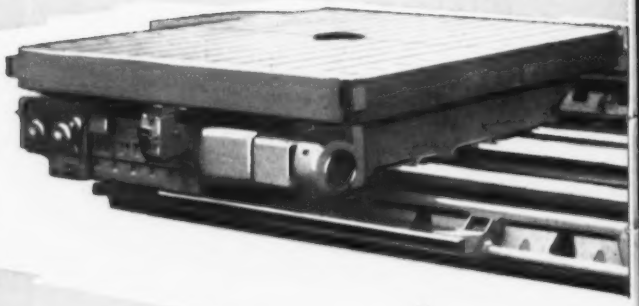

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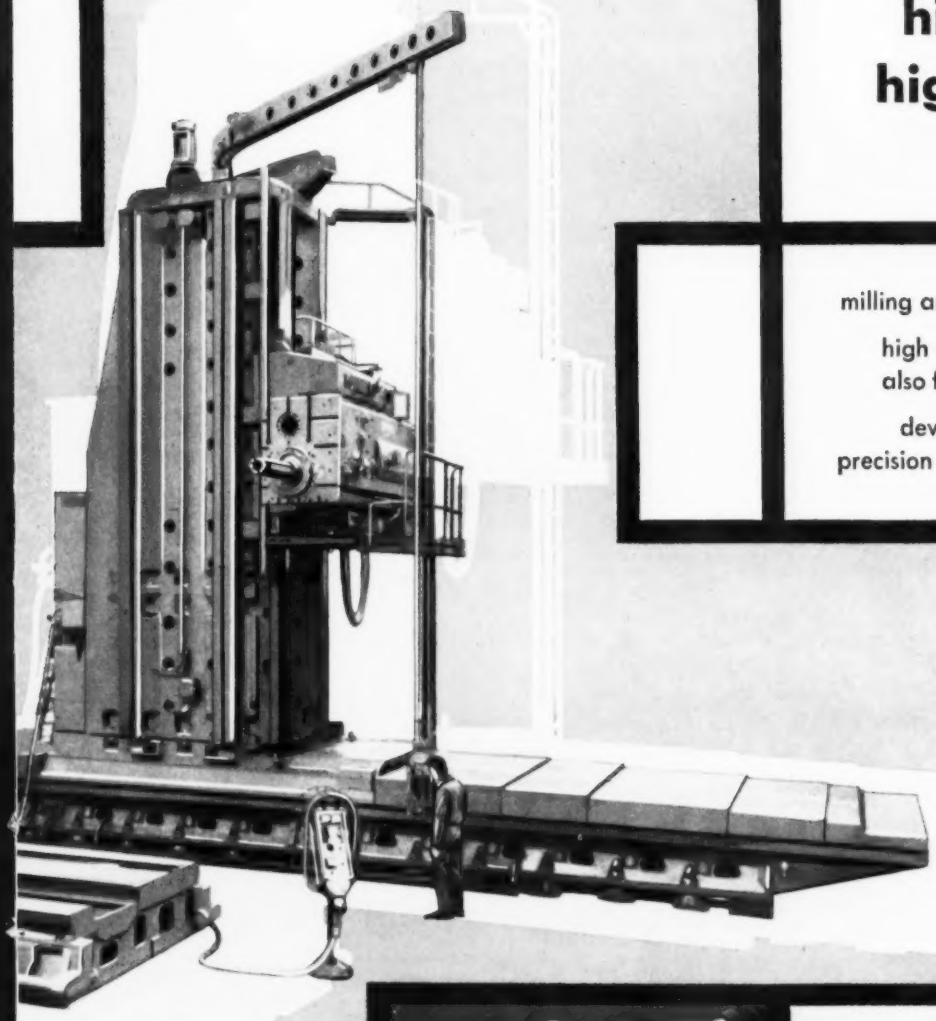

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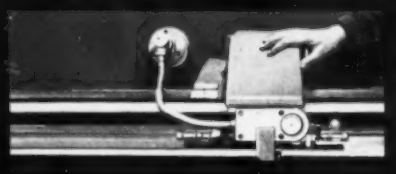

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New Production Ideas

Equipment, Methods and Services

Tramrail Carrier Features Hoist for Dumping

This cab-controlled twin-hook hoist carrier employs an auxiliary hoist for dumping. Of weatherproof construction for outdoor service, the unit picks up tote boxes of materials, hauls them and empties by tipping. While the carrier was especially designed for handling slag in a steel mill, it is suitable for a wide variety of materials such as castings, bolts, nuts and other machined parts, sand and various bulk materials. Hoisting and travel motions are controlled by the cab operator. The main hoist alone raises or lowers a tote box in upright position. Hoist speed is 35 fpm. Travel speed is 250 fpm. Variable speed drum controllers are provided. Capacity is 12,000 lb. Other carriers of different capacities can be furnished. (Cleveland Tramrail Div., Cleveland Crane & Engineering Co.)

For more data circle No. 38 on postcard, p. 85

Gun Sprays Foam Material on Surfaces, Parts

Special foam polyurethane formulations for coating flat or contoured surfaces, fabricated objects, or assemblies can now be put on with a spray gun. Applied with De Villbiss catalyst spray equipment to clean, wax or oil-free surfaces, the formulations will foam-in-place to any desired thickness between ⅛ and 2 in. It can form a surface bond stronger than the material itself. The foam comes in densities ranging between 2 and 20 lb per cu ft, either in rigid or semi-rigid forms and in non-spray formulations as well. Spray applications include: thermal insulation (density 2.5 lb per cu ft, at temperatures from near absolute zero to 200°F); sound insulation; electrical insulation; vibration dampening; as a water-proof void filler; for structural strength; for experimental contouring of airfoils or other surfaces; and many other applicationss. (American Latex Products Corp.)

For more data circle No. 39 on postcard, p. 85

Swivel Gives C-clamps Strength, Long Life

When forced beyond its "normal circumference of travel" this C-clamp swivel pad will not come loose or break. The collar of the pad is thick—and it isn't crimped on to the clamp spindle during manufacture. So it displays considerable strength keeping the pad to the spindle for the tool's life. This is important, for a clamp without a pad is virtually useless, of course. Inside the collar is a groove machined to accept a hardened steel spring. Clamps are assembled by forcing the spindle ball past the spring. The spring then expands beyond the ball, forming a union that will withstand as much force as the spindle itself. (Wilton Tool Mfg. Co.)

For more data circle No. 40 on postcard, p. 85

Control Valves

Leak-free operation and smooth, shockless opening and closing at maximum rated pressure are promised for a new line of 6000-lb, 2 and 3-way control valves. For use on equipment requiring extremely high operating pressures, the valves feature bodies machined from solid aluminum bronze bar stock. Ac-

cording to the manufacturer, use of this stock eliminates valve body distortion under high working pressures. Available in ½ through 2-in. NPT sizes and suitable for control of high pressure fluids, these valves work with any applicable pneumatic or electro-pneumatic cycle control device, or by manual operation. (Sinclair-Collins Valve Co.)

For more data circle No. 41 on postcard, p. 85

Liquid-level Gage

Manufacturers whose processes involve fire and explosion hazards can safely observe liquid levels with a new magnetic liquid-level gage. It's for use where ordinary gages with glass, gaskets and threads cannot be tolerated due to dangers from escaping gases. The instrument has its gaging mechanism in a stainless steel chamber; the scale mounts outside the chamber and actuates magnetically through the chamber wall. Instead of a visible glass for liquid level observation, this gage has a series of edge-magnetized wafers which are attracted to each other to give a continuous scale. One side of the wafers is bright red, the other

Now, for the first time, you can accurately predict what the dimensional characteristics of iron powder will be after sintering operations. You can eliminate the element of uncertainty in powder reaction, before a part or tool is designed, before a production run is started.

This major development is the result of Republic's exclusive *Controlled Dimensional Factor* process of manufacturing iron powder.

CDF means that in the presence of copper, Republic Iron Powder—depending on type—can be made to grow, shrink, or remain stable within acceptable tolerance limits. The powders have been designated as:

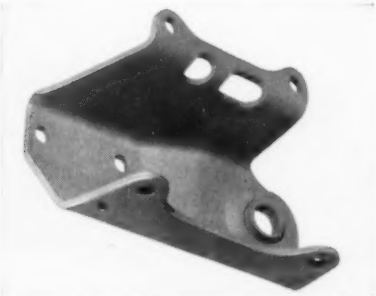
TYPE "G" FOR GROWTH—A powder having a definite growth characteristic in the presence of copper. It was developed for use in many *existing* dies designed for powder which expands when sintered.

TYPE "N" FOR NORMAL—This powder has been given normal variation in dimensional change from slight shrinkage to slight growth, depending upon the end result required.

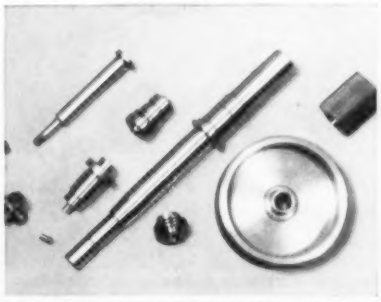
TYPE "S" FOR SHRINKAGE—A powder with an extremely high shrinkage characteristic which can be used to attain certain tensile strengths with lesser quantities of copper.

CDF provides definite benefits for everyone concerned with the design and fabrication of iron powder sinterings. Consistently uniform shrinkage and growth values aid the design engineer in establishing final dimensions of parts. Tool engineers can design tools to part print dimensions with the assurance that tolerances, transverse to the direction of pressing, can be held within ±.001 inches per inch. Fabricators can produce consistently uniform sinterings at faster rates and at minimum cost.

Republic Booklet Adv-763 contains complete information on test evaluations, chemical composition, and physical properties. Mail the coupon for your copy; or for obligation-free metallurgical service.



PRODUCTION FACILITIES, plus complete design and engineering service, go to work for you as an extension of your plant, when you have stamped and drawn parts fabricated by Republic's Pressed Steel Division. One example of a wide variety of steel parts mass-produced to specification, at the lowest possible cost, is the truck-shaft bracket shown above. Write for Booklet Adv. 681.



PRODUCTION OF PRECISION PARTS at higher speeds and feeds with fine finished surfaces and longer tool life, is made possible by the use of Republic Cold Finished Steels. Republic offers you a complete range of carbon, alloy, and stainless analyses drawn to precise size and cross section. Mail the coupon today for complete information on Republic Cold Finished Steels.

PRODUCTION OF BUILT-UP, INTERLOCKING OR ASSOCIATED PARTS is greatly simplified by the use of Republic Cold Drawn Special Sections. Machining time and costs are reduced to a minimum because the sections are preformed to the predominating cross section of the part. Cold drawing also improves physical properties in the parts. Available in all grades of carbon, alloy and stainless steel. Send coupon for more data.

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Please send more information on these Republic products:
- ☐ Iron Powder (Booklet Adv. 763)
- ☐ Stampings (Booklet Adv. 681)
- ☐ Cold Finished Steels
- ☐ Special Sections

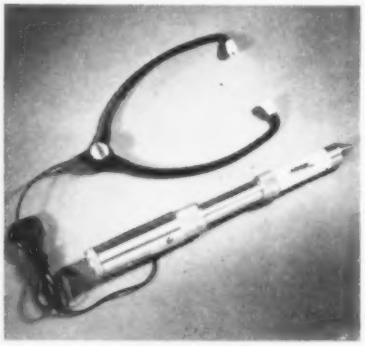
Name_____ Title_____
Company_____
Address_____
City_____ Zone____ State_____

silver. The wafers turn over magnetically as the liquid level changes, similar to the opening or closing of a venetian blind, presenting the red face in a continuous band to the top of the liquid level, contrasted with silver above. (Jorgenson Gage & Valve Co.)

For more data circle No. 42 on postcard, p. 85

Sound Checker

If listening to equipment's innard sounds can help you locate internal noises, etc., then this is for you. It's a detector for testers and inspectors looking for sounds inside bearings, motors, gear-trains, pumps, turbines



and practically anything else. To work it, you simply place the unit next to the piece of equipment; internal sounds readily become apparent. The instrument is an all aluminum transistor set powered by a battery. (Valley Engineering Corp.)

For more data circle No. 43 on postcard, p. 85

Demineralizer

A new demineralizer features cast acrylic columns for both its carbon filter column and iron exchange column. Operating on a mixed bed iron exchange principle, the unit produces up to 100 gph of ultra-pure (less than ½ ppm) tasteless and odor-free water. Plastic glass columns enable the operator to see the action in both columns at all times. The mono-column unit is completely packaged; it's shipped ready to deliver ultra-pure process water upon simple connection to a

plant's service lines. Exchange capacity of the resin charge is 18,000 grains. Overall dimensions are 15 x 15 x 86 in. All piping, valves, screen, eductors, etc., throughout are 100 pct non-corrosive. (Penfield Mfg. Co.)

For more data circle No. 44 on postcard, p. 85

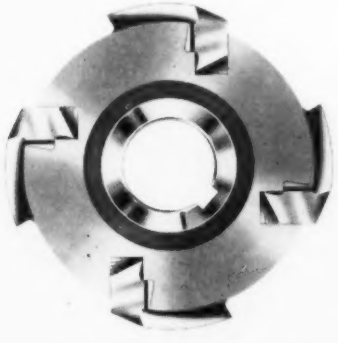
Photo Slides

Photomicrographs can be taken and turned into slides within two minutes with a new setup. And the same goes for practically any kind of slides (for sales presentations, oscillographs, x-ray shots, etc.). Black-and-white, the slides are made with ordinary Land-type cameras. They are made from high-speed film, dipped in a hardener, and mounted in plastic frames. All steps can be done easily by inexperienced users. The developer of the idea believes that slides made by this new process cost about one-third that of conventional ones. (Polaroid Corp.)

For more data circle No. 45 on postcard, p. 85

Milling Cutters

Inserted-blade plain milling cutters boast long wear. For machining aluminum, they incorporate a new blade design which extends their normal grinding life. Available in 4-in. wide right-and-left-hand sections, they are designed for use in gangs made up of equal numbers of right-and-left-hand sections. This arrangement neutralizes end-thrust during machining, permitting maximum blade utilization. (Goddard & Goddard Co.)



For more data circle No. 46 on postcard, p. 85

FREE LITERATURE

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 85.

V-Belting

Uses, advantages, and specifications of one company's roll lot V-belting are explained in a data sheet. In includes some equivalent length tables for endless V-belting replacements. (Boston Woven Hose & Rubber Co.)

For free copy circle No. 1 on postcard, p. 85

Centrifugal Castings

If your product plans call for hollow, cylindrical parts, a 12-page reference catalog will help in specifying centrifugal castings. (Sandusky Foundry and Machine Co.)

For free copy circle No. 2 on postcard, p. 85

Induction Heaters

An 8-page bulletin covers 60-cycle induction heaters with installation photographs and a convenient billet heater selection chart for aluminum. (Magnethermic Corp.)

For free copy circle No. 3 on postcard, p. 85

Wire Drawing

Wire drawing machines are featured in a 4-page folder. It deals with upright cone type, wire drawing machines for high speed, continuous drawing of nonferrous wire in intermediate sizes. (Waterbury Farrel Foundry & Machine Co.)

For free copy circle No. 4 on postcard, p. 85

Hydraulic Cylinder

An all-Teflon sealed hydraulic cylinder and design innovations which make it possible are described in an 8-page brochure. New features detailed in the booklet include a new rod bushing seal, lock-seal cushion adjustment screw, and

a unique tubing end-seal which has strengthened the cylinder's weakest link. Such design changes let the maker raise pressure ratings on its entire line. (Flick-Reedy Corp.)
For free copy circle No. 5 on postcard, p. 85

Blind Fasteners

Blind bolts for high strength blind fastener applications are described in an 8-page brochure. It details advantages of blind bolts and blind nuts, structural and repair applications, design characteristics, tools and guns, installation techniques and hydraulic power units for driving the bolts. (Hi-Shear Rivet Tool Co.)
For free copy circle No. 6 on postcard, p. 85

Hardfacing Alloys

Hardfacing alloys are outlined in a booklet. It includes data on bare rods, powder and crushed particles. The 8-page bulletin gives chemical composition, properties and typical applications for hardfacing alloys in these forms. These include 4 iron-base alloys, 3 cobalt-base alloys, a cast tungsten carbide, and 3 nickel-base alloys. (Haynes Stellite Co.)
For free copy circle No. 7 on postcard, p. 85

Machine Tools

General information on one company's machine tool products is contained in a 22-page catalog. (Jones & Lamson Machine Co.)
For free copy circle No. 8 on postcard, p. 85

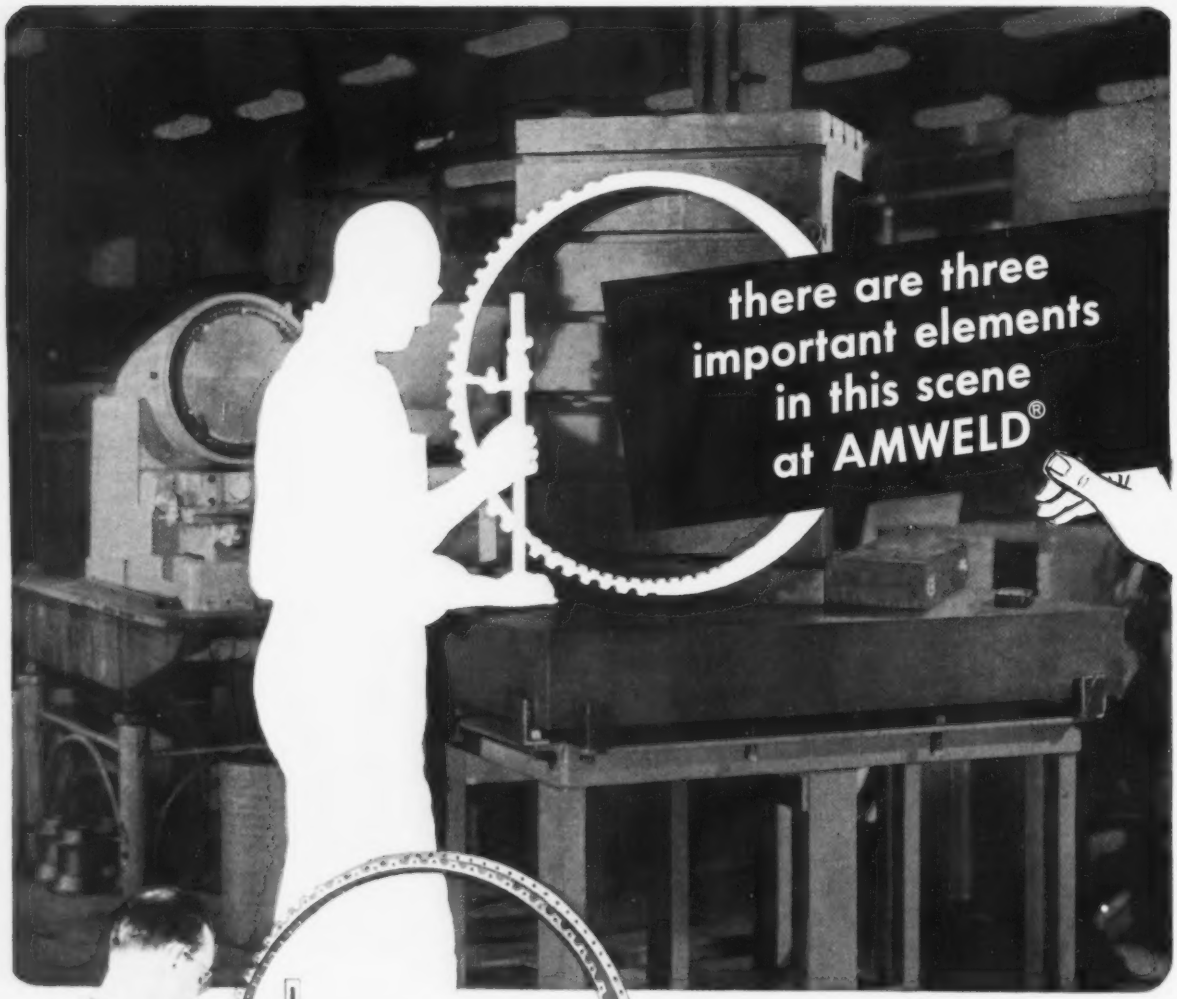
Vises

Drill press and milling machine vises are described in a catalog sheet. (Columbian Vise & Mfg. Co.)
For free copy circle No. 9 on postcard, p. 85

Castings, Patterns

Prototype to finish-casting services offered by a job shop are pictured in a 24-page booklet. It tells how the firm turns out fine aluminum and magnesium castings, as well as wood and metal patterns. It also lists physical properties and conforming specifications for magnesium and aluminum alloys. List-

(Continued on Page 92)



PRECISION PRODUCTS—American Welding specializes in the forming, flash welding, sizing and machining of rings and circular components, from 6" to 96" in diameter, of ferrous and non-ferrous metals, including titanium and heat-resisting alloys.

QUALITY CONTROL—Amweld works to rigid specifications. We are proud that we are suppliers of rings and components to every major U. S. jet engine manufacturer.

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FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Heavy-duty Drills

Reversible, heavy-duty electric drills in a new series are outlined in a 4-page folder. It offers details of the units' one-third additional power, design developments, and specifications. Drills come in 5/8, 3/4, 7/8 and 1-in. models. (Thor Power Tool Co.)

For free copy circle No. 20 on postcard

Tube, Bar Stock

Standard bar and tube stock now offered by one supplier in three special materials is analyzed in a bulletin. This stock comes in: GC Meehanite Metal, GA Meehanite Metal and Type No. 1 Ni-Resist. (Centrifugally Cast Products Div., The Shenango Furnace Co.)

For free copy circle No. 21 on postcard

Safe Ladders

Non-skid abrasive ladder rungs which last as long as steel and provide safe footing on ladders even when they are wet or oily are described in a 4-page brochure. Baked into the surface of the ladder rungs, the abrasive surface is available for every type ladder. (Reliance Steel Products Co.)

For free copy circle No. 22 on postcard

Weld, Heat Blowpipe

Entirely new, a welding blowpipe welds any metal thickness from 28-gage sheet to 3-in. plate. It handles gas flows down to 2 cu ft per hr for precision welding, or total flows as high as 1500 cu ft per hour for heavy heating operations. Cutting attachments quickly convert it from welding and heating to flame-cutting on all metal thicknesses to 8 in. Information on the blowpipe is given in an 8-page folder. (Linde Co., Div. of Union Carbide Corp.)

For free copy circle No. 23 on postcard

Rivets

Titanium rivets available in production quantities in a full range of sizes are described in new literature. These rivets combine light weight with high strength for applications under extreme environmental conditions. (Hi-Shear Rivet Tool Co.)

For free copy circle No. 24 on postcard

Cushioned Valves

Cushioned valves in action appear in a 4-page bulletin. Schematically shown are varying piping and valve arrangements for particular applications, such as supply water to mill, accurate water level control in reservoirs, emergency fire protection, and isolating part or all of a system. (Golden-Anderson Valve Specialty Co.)

For free copy circle No. 25 on postcard

Spring Pins

Cost-saving applications of one maker's spring pins in a variety of product assemblies are illustrated in a 4-page folder. The spring pins—slotted, tubular pins that lock by spring action when driven into standard commercial holes—eliminate tapping, reaming, peening and milling operations. (Standard Pressed Steel Co.)

For free copy circle No. 26 on postcard

Circuit Breakers

Residential type plug-in circuit breakers and circuit breaker load centers are detailed in a 12-page bulletin. (General Electric Co.)

For free copy circle No. 27 on postcard

Plating Filter

Describing a compact, portable filter for a wide variety of plating solutions is a data sheet. Measuring 12-in. in diam and 28-in. high, the unit has 3.5 sq ft of filtering area

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FREE LITERATURE

and a capacity of 900 gph free flow and 600 gph with carbon charge. (Hanson-Van Winkle-Munning Co.)

For free copy circle No. 28 on postcard

Low-lift Truck

Low-lift pallet transporters are covered in a bulletin. It details walkie-type, electric driven industrial trucks with lifting capacities of 4000 and 6000 lb. They are only 29¼ in. long plus load; yet, they have a standard 15½-in. battery compartment. (Automatic Transportation Co.)

For free copy circle No. 29 on postcard

Silicone Rubber

Electrical insulating advantages of a new silicone rubber are outlined in a brochure. It includes a tabular summary of dielectric properties of typical stocks at temperatures ranging from 25 to 250°C. Typical uses: transformer and motor coils, wire and cable, strip heaters, electronic assemblies. (Dow Corning Corp.)

For free copy circle No. 30 on postcard

Grinders

A 24 page catalog describes and illustrates 14 and 18-in. universal grinders. (Landis Tool Co.)

For free copy circle No. 31 on postcard

Powdered Acid

Properties and uses of a recently introduced powdered acid scale and rust remover are described in a service report. It points out conveniences inherent in shipping, storing, and using a powdered acid. (Oakite Products, Inc.)

For free copy circle No. 32 on postcard

Air Suspensions

Air suspension systems for highway semi-trailers are presented in a 4-page bulletin. It covers both single and tandem air suspensions. The single model, available in 18,000 and 20,000-lb capacities, is designed for frame widths of 34 to 40 in. Tandem models spaced 50 in., designed for similar frame widths, are available in 32,000 and 36,000-lb capacities. (Automobile Div., Clark Equipment Co.)

For free copy circle No. 33 on postcard

Alloy Dies

Alloy dies and similar products are detailed in a catalog. Equipment covered includes: square and hexagon shape drawing dies; round wire, bar, and tube drawing dies; rough mandrel nibs; rough cored heading die nibs; nail and tack tooling inserts; barbing laps; straight and buttom head perforators; wire puller jaw inserts; and die finishing equipment. (Firth Sterling, Inc.)

For free copy circle No. 34 on postcard

Live Centers

"Engineered" live centers are reported on in a 4-page catalog. It gives specifications and new prices of standard centers which are made with Morse taper; it also includes three types of specials. More than 40 other special centers are illustrated which were "engineered" for some specific purpose metal working operation. (Sturdimatic Tool Co.)

For free copy circle No. 35 on postcard

Heat Treating

A company's publication features a story on facilities of a large western commercial heat treating company. A modern controlled-atmosphere setup which processes an endless variety of metal parts is shown. (Surface Combustion Corp.)

For free copy circle No. 36 on postcard

Press Welders

A bulletin illustrates standard type press welders. It gives examples of various types of special tooling for increasing production on small to medium size welded assemblies. (Resistance Welder Corp.)

For free copy circle No. 37 on postcard

Speaking of technical bibles...

here's one that every engineer should have at his fingertips

Without this excellent book, your technical library isn't complete. If you haven't already received your free copy, by all means send for it now.

In it you'll find everything you want to know about USS "T-1" Constructional Alloy Steel—where to use it, when to use it, how to use it; its engineering properties, metallurgical characteristics, fabrication practices, and dozens of interesting illustrated applications.

USS "T-1" Steel is tomorrow's steel available *today*—the remarkable new alloy steel that is drastically influencing design thinking all along the line. Cutting costs, improving products, building them lighter yet stronger—these are some of the very desirable advantages USS "T-1" Steel offers you.

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Vacuum casting of ingots...

a new technology in production of USS Quality Forgings

76-ton ingot cast to produce a generator rotor forging for Large Steam Turbine-Generator Department, General Electric Company.

THE HIGHEST ART OF STEELMAKING is probably exemplified in forged alloy steel turbine and generator rotors for electric power generating equipment. Many of these rotors operate at high temperatures under heavy loads and are, therefore, subjected to the most rigorous inspection through each step of the manufacturing cycle.

Entrapped gases, especially hydrogen, have been suspected of contributing to undesirable internal discontinuities in these large forgings. There is also evidence that hydrogen is associated with low ductility. Several years of experimenting in our melt shops indicated that relatively low hydrogen levels were possible but not low enough to solve the problem completely. The next step was to provide equipment for casting these gigantic ingots in a vacuum, thus removing the gases at the time of pour.

Tests on our vacuum cast forgings produced to date indicate a hydrogen reduction of more than 80% compared with previous air cast methods. Our casting chamber, where atmospheric pressure is reduced 99.9%, is designed to contain an ingot as large as 95" in diameter, weighing about 350,000 pounds. The equipment in which these large ingots are cast was specially designed by United States Steel.

This is but one of the many advances in steel technology constantly emerging from the research laboratories and mills of United States Steel.

We are eager to receive your inquiries. Please address them to United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

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heavy machinery parts . . . carbon, alloy, stainless
forged steel rolls and back-up roll sleeves
electrical and water wheel shafts
specialty forgings of all types

UNITED STATES STEEL

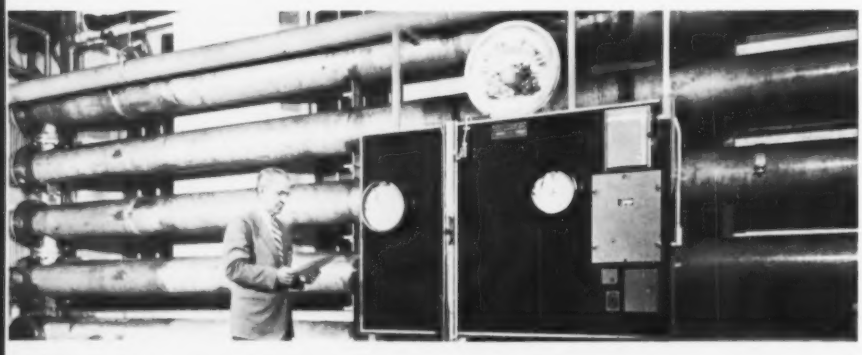
NOTHING can equal Stainless Steel

in its unique combination of properties

No other design material can match Stainless Steel in its combination of desirable properties: corrosion resistance, strength, hardness, beauty, cleanability and easy fabrication. For a reliable source of supply, United States Steel offers you the widest range of types, finishes and sizes. **Just call your steel warehouse.**

For Humid Locations. The Richmond Sifter is made by Sprout-Waldron in Muncy, Pa. Unit shown here has two sets of full-size sieves, containing up to 90 square feet of bolting area. Up to six separations can be made from each of the two sections, and two different materials can be spouted to the sifter. Stainless Steel sieves are supplied when humidity or temperature is high—or when corrosive materials must be sifted. Many sifting applications could not be economically handled without the Stainless Steel sieves.

For Permanent Beauty. The Santa Fe made news last year when they announced the revolutionary "El Capitan" train. Cars are 15½ feet high, two feet higher than standard, and they are completely sheathed with beautiful Stainless Steel. And in addition to being a glamour metal, Stainless has the corrosion resistance to assure years of gleaming beauty. One Stainless Steel train has been in service over 20 years, and the exterior is still in perfect condition.



For Operating Economy. A textile manufacturer found that they could save about $70,000 **yearly** by using waste hot water to pre-heat the incoming fresh process water. Problem: the hot water had a heavy caustic soda content. Solution was a super-efficiency unit purchased from Ludell Manufacturing Company, in Milwaukee. It is made completely from Type 304 Stainless Steel and contains **19,000** lineal feet of tubing inside the shell units. It is doubtful that any other material could have been used under these conditions. Even better, the unit is expected to last indefinitely.

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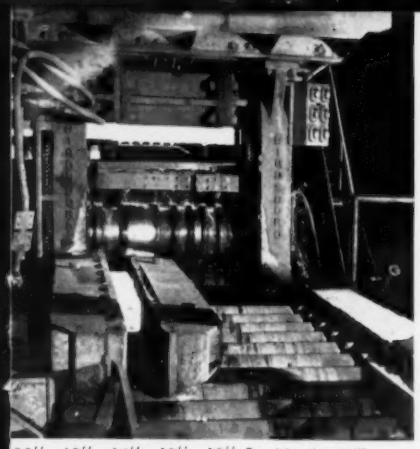
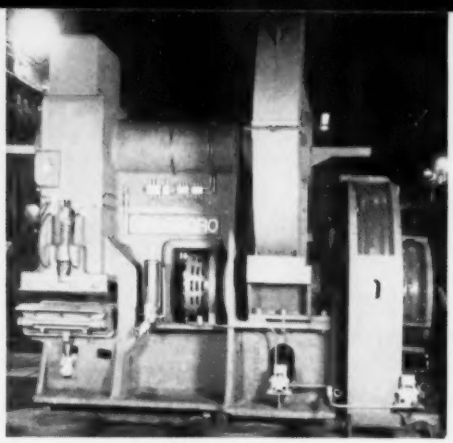
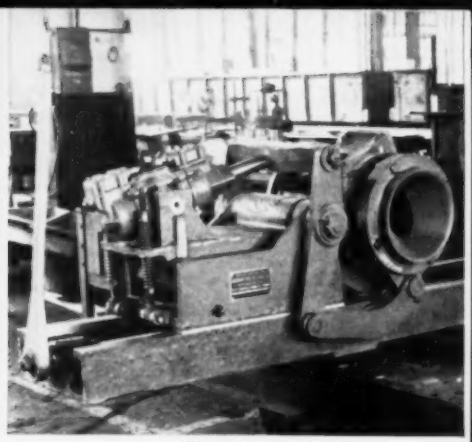
UNITED STATES STEEL



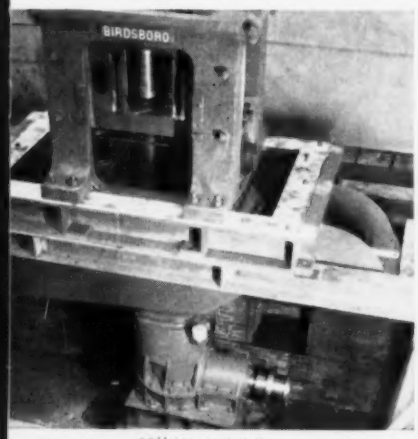
20"—18"—14"—12"—10" Combination Mill



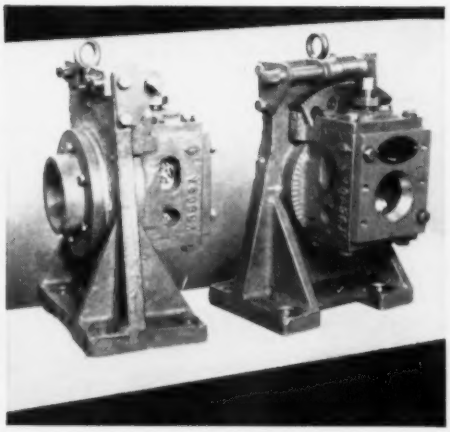
300-Ton Cold Shear



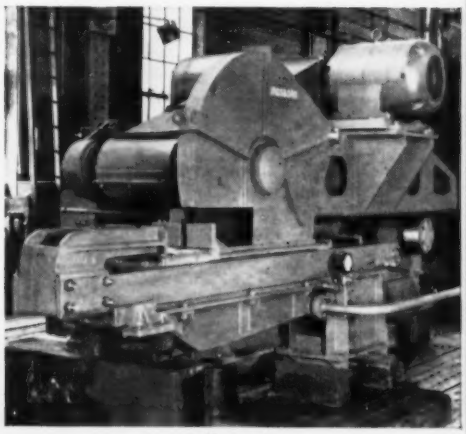
18" Mill Bar Turner



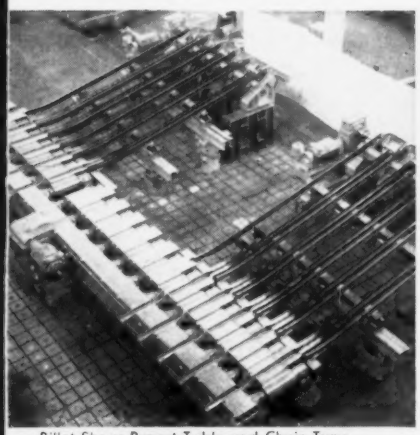
10" Vertical Mill



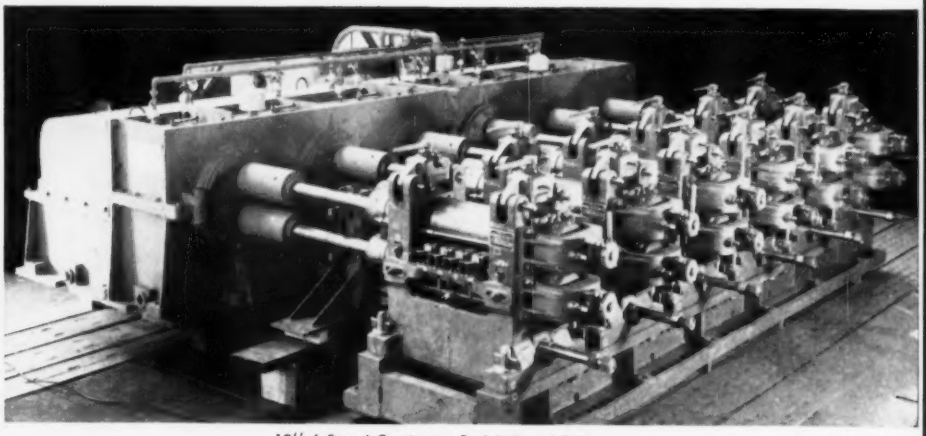
Two Oval Twisters



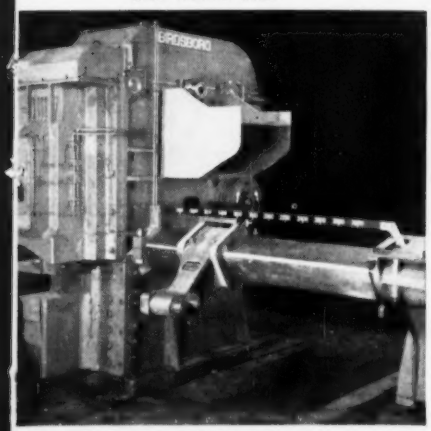
54" Hot Saw



Billet Shear Runout Table and Chain Type Billet Transfer Beds



10" 6-Stand Continuous Rod Mill and Drive



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FREE LITERATURE

ings include alloys for sand castings, permanent mold and rare earth alloys. (Wellman Bronze & Aluminum Co.)

For free copy circle No. 10 on postcard, p. 85

Materials Handling

Case histories of seven manufacturers tells how they solved production, storage and shipping problems with modern materials handling equipment. The case studies appear in an illustrated folder. (Lewis-Shepard Products, Inc.)

For free copy circle No. 11 on postcard, p. 85

Blast Cleaners

Blast cleaning equipment is covered in a firm's literature. It describes floor-type, double-duty and high production units. Also mentioned are portable setups. (Cyclone Sandblast Equipment.)

For free copy circle No. 12 on postcard, p. 85

Steel Collars

Common applications for one maker's steel shaft collars on various machinery are shown in a bulletin. It reviews construction details and specification information on the collars, available in 43 standard sizes for shafts ranging from $\frac{1}{8}$ to 3-in. diam. (Standard Pressed Steel Co.)

For free copy circle No. 13 on postcard, p. 85

Electropolisher

In its dozen pages, a publication deals with several items for metallurgical laboratory use. Among these is a new metallographic electropolisher, which it describes as having several unique features. These include: (1) change of electrolyte by changing tanks instead of pouring; (2) simple operation; (3) easy cleaning; (4) impact and corrosion resistance. (Buehler, Ltd.)

For free copy circle No. 14 on postcard, p. 85

Lightweight Welder

Small shops can now get a lightweight welder to join metal once

reserved for drilling and riveting, drilling and bolting—and, of course, welding with a much heavier, bulkier unit. The welder, weighing just 84 lb, has a rated current load of 20 amp at 220v. It's 12-in. high, 9-in. wide, 14-in. long. Operation, according to a new 4-page descriptive folder, is "simple as A-B-C." (The Lincoln Electric Co.)

For free copy circle No. 15 on postcard, p. 85

Muffle Furnaces

Gas-fired muffle furnaces are outlined in a 4-page bulletin. It includes field-tested applications for bright heat-treating and brazing of special steels and nonferrous metals with the units. (Surface Combustion Corp.)

For free copy circle No. 16 on postcard, p. 85

Vibrators

Vibrators for quality foundry molds are described in a folder. The 4-page publication features the complete vibrator line according to size and mounting for varied requirements. It also gives specifications and descriptions of accessories, including a blow gun, operating valves and hose connections. (Osborn Mfg. Co.)

For free copy circle No. 17 on postcard, p. 85

Dc Power Supplies

Custom-built dc power supplies are shown in a 6-page folder. It details tailor-made systems for computer, aircraft, military and special applications. (General Electric Co.)

For free copy circle No. 18 on postcard, p. 85

Steam Traps

How an inverted open float steam trap removes condensate and keeps steam lines hot and dry is explained in a 6-page folder. It includes tables and instruction for selecting traps for any condensate discharge condition. Traps with unusually high discharge capacities come in size from ½ to 1 in., in working pressures from 1 to 300-lb saturated steam. (Crane Co.)

For free copy circle No. 19 on postcard, p. 85

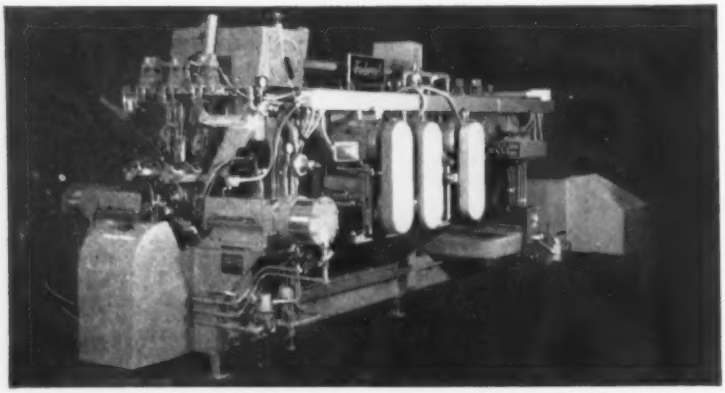
one-source production lines spark interest of volume producers . . .

The prospect of ordering an entire production line, ready made to produce a part to specification, has arrested the interest of many of the nation's top production engineers.

One source responsibility assuring better service; a line 100% harmonic, all stations engineered to work in perfect synchronization; integrated and automated handling of work in process; utilization of common drives and bases, reducing operating costs and floor area, are some of the advantages of the packaged line that has production people talking.

Federal/Warco pioneered the packaged line and have already produced automated lines combining such operations as blanking, forming, drawing, welding, machining, drilling, assembling on a common base.

For additional information contact the Federal/Warco representative nearest you or write direct.



This Federal Packaged Production line welds, spot faces, reams, de-burrs, sets six bolts and welds them in place . . . ejecting finished pedal brackets at a rate of 775 pieces per hour.

Federal / Warco
PACKAGED
PRODUCTION LINES

THE FEDERAL MACHINE AND WELDER COMPANY - WARREN, OHIO

427 AFFILIATED WITH BERKELEY-DAVIS, INC., DANVILLE, ILLINOIS, MANUFACTURERS OF AUTOMATIC ARC WELDING EQUIPMENT

The Iron Age Summary

Outlook Good for Steel Buyers

Steady supply improvement seen in the months ahead. New capacity still coming in.

Steel firms believe 1957 will wind up as industry's third best year.

■ Steel users can count on a steady improvement in steel supply in the months ahead. Only a national emergency could radically alter this outlook.

Here are the reasons behind this prediction: (1) The mills are still adding new capacity, (2) uninterrupted steel production is assured for at least another year and a half, and (3) steel users have no incentive to rebuild inventories so long as most products are in good supply at the mill level.

Tight Products Ease—Even some of the tighter steel products are showing signs of easing. Heavy plate and structurals are in slightly better supply. And a Midwestern mill is reported to have taken oil country goods off the so-called "quota" basis that has prevailed for months. Under the "quota" system, the mills allocate available supply to avoid hardship.

Customer "scare" buying of steel apparently has been put on the shelf for the time being. The automotive companies, for instance, give no sign that they plan to load up on steel and finished cars on the chance that next summer's auto labor negotiations will lead to a strike. Before committing themselves, they want to get a good idea of what Walter Reuther will demand for his members. This means they will wait until after the auto union meets this winter and formulates its negotiating policy. Then the automakers will decide whether to stock up on steel and new cars.

Mills Not Discouraged—Still, it's hard to find a steel company president who is discouraged about the outlook. They are quick to point out that when all the returns are in for 1957 the year will turn out to be at least the third best in history. Indications are that output will run about 115 million ingot tons. This would be slightly below last year's 115.2 million tons and compares with 1955's record 117 million tons.

In Detroit, steel salesmen are not too happy about their orders for December delivery. They're afraid, for the moment at least, that December orders will be below those for November. In all likelihood they will be comparable with or slightly below October.

Orders Geared To Sales—Overall, the market has steel men somewhat puzzled. Orders are down one week and up the next. Users are shifting delivery dates from one month to the next and back again. Apparently, their views on deliveries depend on the outlook for sales of their own products. This is another indication of how closely users are gearing their steel inventories to their sales position.

The trend in scrap continues down. Prices in major consuming areas either are still slipping or barely holding their own. There is little mill interest in scrap.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,048	2,061	2,125	2,511
Ingot Index				
(1947-1949=100)	127.5	128.3	132.3	156.3
Operating Rates				
Chicago	78.0	80.0	82.0	103.0
Pittsburgh	81.0	81.0	85.0	101.0
Philadelphia	88.0	88.0*	84.0	107.5
Valley	66.0	67.0*	72.5	98.0
West	81.0	85.0*	98.5	105.0
Buffalo	95.0	100.0	100.0	105.0
Cleveland	94.0	94.0*	87.0	105.0
Detroit	94.0	94.0*	96.0	106.0
S. Ohio River	84.0	86.0*	78.0	84.0
South	69.0	71.5	72.0	96.0
Upper Ohio R.	69.0	72.5*	95.5	105.0
St. Louis	92.0	90.0	94.0	105.0
Northeast	41.0	40.0	41.5	100.0
Aggregate	80.0	80.5	83.0	102.0*

*Revised—NOTE—"Year Ago," Oct. 24 issue, should have been 102.0.

Prices At a Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.967	5.967	5.967	5.622
Pig Iron (Gross ton)	$66.42	$66.42	$66.42	$63.04
Scrap, No. 1 hvy (Gross ton)	$34.00	$35.33	$40.83	$57.50
No. 2 bundles	$25.67	$26.33	$30.17	$44.50
Nonferrous				
Aluminum ingot	28.10	28.10	28.10	27.10
Copper, electrolytic	27.00	27.00	27.00	40.00
Lead, St. Louis	13.30	13.30	13.80	15.80
Magnesium Ingot	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	64.50
Tin Straits, N. Y.	91.375	91.00*	93.375	108.25
Zinc, E. St. Louis	10.00	10.00	10.00	13.50

PURCHASING

Adhesives Riding Boom Market

Business is good, as cost advantages, and versatility of industrial adhesives continue to win new users.

More data from buyers on application conditions will aid makers in correctly matching the product to the job.

▪ Adhesives, once thought of as a paste pot and paper market, have kept a boom growing that started in World War II. There are some good reasons why business should continue to get better, too.

Nearly every metal-using industry is finding it can employ sticky stuff and shave costs to boot. Metal bonding adhesive performance has reached a point where competition with mechanical and fusion methods for structural joining is now possible. In many cases it is not only possible, but highly desirable.

Facts Wanted — Manufacturers are agreed adhesives are just about the most versatile fasteners available. They agree just as readily on another point. Customers making inquiries seldom furnish enough information or the right kinds of information for the manufacturer to analyze buyer needs.

Manufacturers all require the same information. There are eight good points to keep in mind when inquiring about adhesives.

If possible, send a working sample or specimens of materials to be bonded.

Name the materials to be bonded —rubber on steel, aluminum on hardwood, etc.

Give end use of the assembly—this gives an idea of stresses involved, elasticity requirements, etc.

Supply temperature extremes in service—high and low.

Mention exposure to solvents—water, oils, acids, alkalis.

Tell how adhesive is to be applied—brush, flow, spray, dip, doctor knife.

Give drying time limits—maximum and minimum before and after assembly.

Any additional factors that must be considered — color, inflammability, odor.

Good Joiners — If an adhesive doesn't exist that can perform a job properly, manufacturers' research laboratories will undertake to develop an adhesive for the job. In almost all cases, this service is undertaken at no cost to the customer.

Adhesive Sandwich — Sandwich construction is an example of the growing importance of adhesives to industry. Adhesives play a vital role both in assembly of core materials and in attachment of skins to cores. These sandwiches are generally made in the form of panels and are contributing to radically different design concepts in aircraft, architecture and other fields of construction.

Main Target—Heat — Adhesive manufacturers haven't licked all of their problems yet, however. Heat is still the biggest enemy of the business. Most research is aimed at getting greater strength at higher temperatures. The goal is adhesives to withstand temperatures above 1000°F for organic adhesives.

Makers see a solution to this problem, though, before very long. A lot of work is being done with metallic salts in an organic carrier. The carrier is burned off leaving the salt for bonding. When they crack this, the adhesive boom will zoom.

STICKING TOGETHER: Automakers were among the first to use adhesives in production line applications such as this bonding of rubber mat to metal on a truck. (Minnesota Mining and Mfg. Co. photo.)

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WALLACE BARNES STEEL DIVISION—Producer of High-Carbon Strip Steel

Delivery Promises Often Bettered

Mills continue paring delivery estimates to the bone in battle for orders.

Often they are phrased in "iffy" terms with prospect semi-finished or finished stocks may speed processing.

■ Fast delivery is still the steel salesman's best lever in prying loose buyer orders.

Mill delivery estimates, as surveyed by the IRON AGE, are either holding at month ago levels or shortening. Cold-rolled sheet and strip are still at about 4-6 weeks. Hot-rolled products have fallen from 3-5 to 2-4 weeks in many markets.

Other products on which deliveries have improved are structurals, light plate, oil country goods, and stainless sheet and strip. Fast delivery, sometimes a week or less, remains for cold finished and hot-rolled bar, merchant wire and butt-weld pipe.

Quota allocations are being scrapped in some cases for structurals, oil country goods and large diameter welded pipe. Even heavy structurals now need sales push in some areas. And production of wide flange beams could catch up to demand by year's end.

Plate Price Drop—A drop of $12 in the price of carbon plate was made by Claymont Plant of Colorado Fuel & Iron Corp. on Oct. 21. The firm, formerly a premium price producer, is now selling at 5.10, the general level of the market.

Sheet and Strip — Cold-rolled products are maintaining the same delivery schedules reported a month ago—generally 4-6 weeks. Hot-rolled products, in an analysis of all markets, have lost a little ground, down from 3-5 weeks, to 2-4 weeks. However, in the **Midwest** cold-rolled sheet and strip appear likely to better this month's tonnage in November. Automotive ordering is an important factor in the improvement. Enameling iron sheet in that market is holding up better than cold-rolled, remaining at 5-7 week delivery. **Eastern** mills report some juggling on auto tonnages they are getting—automakers, for example, may move back November tonnages to December one day, then send in a new order for November a few days later. **West Coast** mills report a flurry of orders for galvanized products.

Plates and Shapes — In some cases more selling efforts are needed now to get orders for heavier plate. New bookings are slow coming in, but mills are still at capacity operations and many have backlogs. Structurals continue to show easing. **Midwest** mills report heavy structurals are now current in delivery despite former carryovers of 45 to 60 days. Warehouses and some fabricators there have turned down some heavy structurals. Eastern fabricators haven't cut back mill orders yet, although their own job backlogs have dropped.

Warehouses—October sales will bring little cheering at many outlets. The month will show a drop in general business ranging from 1 to 5 pct. Some distributors are running 15 to 30 pct below year ago sales levels. Mill ability to provide fast delivery on flat-rolled products, often in as little as 2 weeks, is costing warehouses sales. The distributors are encouraged, however, by the fact they're whipping their own cold-rolled sheet inventories into line. Any overstocking now is usually in hot-rolled bar, light plate, angles, and, in a few instances, galvanized sheet.

Pig Iron—Nationwide production is off about 15 pct. Consumer inventories are averaging about a 30-day supply. And some producers are building sizable stocks of their own. In markets similar to this in the past, foundries have usually cut back on their inventories severely.

Delivery Promises at a Glance

	Pittsburgh	Chicago	Cleveland	Detroit	East	West Coast
CR Carbon Sheet	3-5 wks	4-5 wks	4-6 wks	4-6 wks	4-6 wks	4-6 wks
HR Carbon Sheet	2-5 wks	2-3 wks	3-5 wks	2-4 wks	2-4 wks	6-8 wks
CR Carbon Strip	2-3 wks	4-5 wks	4-6 wks	4-6 wks	4-6 wks	4-6 wks
HR Carbon Strip	2-3 wks	2-3 wks	3-5 wks	2-4 wks	2-4 wks	10 wks
HR Carbon Bars	2-3 wks	1-3 wks	3 wks	2-5 wks	3-4 wks	4 wks
CF Carbon Bars	2-6 wks	1-4 wks	1-2 wks	1-4 wks	3-6 wks	4 wks
Heavy Plate	Quota	Quota			Quota	Quota
Light Plate	3-4 wks	2-3 wks	3-5 wks		4-5 wks	Quota
Merchant Wire	1 wk	1 wk	2 wks		1 wk	4 wks
Oil Country Goods	2-12 wks	2-4 wks	14-16 wks		2-8 wks	
Linepipe	Quota	Quota	14-16 wks		Quota	4th Q.
Buttweld Pipe	1 wk	2 wks	1 wk	1 wk	1 wk	4-5 wks
Std. Structurals	6-8 wks	6-8 wks		4-6 wks	6-8 wks	6 wks
CR Stainless Sheet	2-4 wks		1-2 wks	1-3 wks	2-4 wks	
CR Stainless Strip	2-4 wks		1-2 wks	1-3 wks	2-4 wks	

COMPARISON OF PRICES

(Effective Oct. 29, 1957)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	Oct. 29 1957	Oct. 22 1957	Oct. 1 1957	Oct. 30 1956
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.925¢	4.925¢	4.925¢	4.675¢
Cold-rolled sheets	6.05	6.05	6.05	5.75
Galvanized sheets (10 ga.)	6.60	6.60	6.60	6.80
Hot-rolled strip	4.925	4.925	4.925	4.675
Cold-rolled strip	7.17	7.17	7.17	6.870
Plate	5.12	5.12	5.12	4.87
Plates, wrought iron	13.15	13.15	13.15	10.40
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	47.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.30	$10.30	$10.30	$9.85
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	8.55
Special coated mfg. ternes	9.55	9.55	9.55	9.10
Bars and Shapes: (per pound)				
Merchant bar	5.425¢	5.425¢	5.425¢	5.075¢
Cold finished bars	7.30	7.30	7.30	6.85
Alloy bars	6.475	6.475	6.475	6.125
Structural shapes	5.275	5.275	5.275	5.00
Stainless bars (No. 302)	45.00	45.00	45.00	40.75
Wrought iron bars	14.45	14.45	14.45	11.50
Wire: (per pound)				
Bright wire	7.65¢	7.65¢	7.65¢	7.20¢
Rails: (per 100 lb.)				
Heavy rails	$5.525	$5.525	$5.525	$5.075
Light rails	6.50	6.50	6.50	6.00
Semifinished Steel: (per net ton)				
Rerolling billets	$77.50	$77.50	$77.50	$74.00
Slabs, rerolling	77.50	77.50	77.50	74.00
Forging billets	96.00	96.00	96.00	91.50
Alloy blooms, billets, slabs	114.00	114.00	114.00	107.00
Wire Rod and Skelp: (per pound)				
Wire rods	6.15¢	6.15¢	6.15¢	5.80¢
Skelp	4.875	4.875	4.875	4.225
Finished Steel Composite: (per pound)				
Base price	5.967¢	5.967¢	5.967¢	5.622¢

	Oct. 29 1957	Oct. 22 1957	Oct. 1 1957	Oct. 30 1956
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.51	$70.51	$70.51	$67.76
Foundry, Valley	66.50	66.50	66.50	63.00
Foundry, Southern Cin'ti	71.65	71.65	71.65	67.17
Foundry, Birmingham	62.50	62.50	62.50	59.00
Foundry, Chicago	66.50	66.50	66.50	63.00
Basic, del'd Philadelphia	70.01	70.01	70.01	66.84
Basic, Valley furnace	66.00	66.00	66.00	62.50
Malleable, Chicago	66.50	66.50	66.50	63.00
Malleable, Valley	66.50	66.50	66.50	63.00
Ferromanganese, 74-76 pct Mn, cents per lb‡	12.25	12.25	12.25	11.75
Pig Iron Composite: (per gross ton)				
Pig iron	$66.42	$66.42	$66.42	$63.04
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	*$33.50*	$35.50	$41.50	$57.50
No. 1 steel, Phila. area	*36.00*	37.00	40.50	57.50
No. 1 steel, Chicago	33.50	33.50	40.50	57.50
No. 1 bundles, Detroit	*22.50*	25.50	31.50	56.50
Low phos., Youngstown	*33.50*	35.50	44.00	65.50
No. 1 mach'y cast, Pittsburgh	*50.50*	52.50	54.50	59.50
No. 1 mach'y cast, Philadel'a	50.50	50.50	52.50	58.00
No. 1 mach'y cast, Chicago	41.50	41.50	44.50	56.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	*$34.00*	$35.33	$40.83	$57.50
No. 2 bundles	*25.67*	26.33	30.17	45.50
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.38	$15.38	$15.38	$14.50
Foundry coke, prompt	$17.50-$19	$17.50-$19	$17.50-$19	$17-18
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	27.00	27.00	27.00	40.00
Copper, Lake, Conn.	27.00	27.00	27.00	40.00
Tin, Straits, N. Y.	**91.375†**	91.00*	93.375	108.25
Zinc, East St. Louis	**10.00**	**10.00**	**10.00**	**13.50**
Lead, St. Louis	13.30	13.30	13.80	15.80
Aluminum, virgin ingot	28.10	28.10	28.10	27.10
Nickel, electrolytic	74.00	74.00	74.00	64.50
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	33.00	33.00	33.00	33.00

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

INDEX TO PRICE PAGES

IRON AND STEEL SCRAP MARKETS

No Buying in Sight; Slide Continues

Trade waits in vain for significant buying to put a floor under the falling market.

Mills show little interest in scrap. The few sales made are for small tonnages.

■ The market continues to sag, deep in the doldrums of the softest market in two years.

Demand continues virtually nonexistent. Mills show no tendency to buy more than a few token orders here and there. Export on the East Coast is even weaker, with export prices in New York dropping to the domestic level.

Railroad grades are particularly soft. But their level has been higher, by comparison, than other grades and the normal differential is apparently being restored.

To add to the depressing factors, most early automotive lists were down an additional $2 to $3 and the dealer market dropped in sympathy.

There is no indication that mills are short on inventory and there is little speculation of any significant buying in the near future.

The IRON AGE No. 1 Heavy Melting Composite Price continued its downward drop to $34.00, on a par with the level of May, 1955. This compares with the all-time high of $65.17 in December, 1956.

Pittsburgh—Prices of most grades are down again as industrial offerings and small orders by a local mill show continued weakness. A special lot of industrial bundles was sold for $35 a ton, $6 under last month's lowest broker price. This month's full industrial list is expected to go for several dollars less. Drop in industrial grades is squeezing dealer grades downward, but there is a question just how much further dealer scrap can realistically fall.

Chicago—Following a burst of buying activity last week, mill action slowed once again, and the market continued its decline. No. 2 dealer bundles were offered at $22. They failed to draw mill purchases, but reflected increasing firmness. Factory bundle bid prices showed strength. Chief weakness appeared to be in railroad grades, but purchasers are pointing out that rail grades are out of line with the rest of the list. Prices for No. 2 bundles and mixed borings and turnings were incorrectly quoted in Oct. 24 issue. Correct prices: No. 2 bundles, $20 to $21; mixed borings and turnings, $19 to $20.

Philadelphia—Small tonnages of No. 1 heavy melting were bought by a district mill at $1 under last week's level, sending the price down to $35.50—$36.50. Also dropping $1 were low phos grades, heavy breakable cast and cupola cast. Electric furnace bundles fell $4 to $40—$41. Export is moderately active.

New York—This market continues weak, with export prices dropping to the level of domestic demand. Turnings are off, as are most cast grades.

Detroit—The trade is looking anxiously toward the big industrial lists closing this week. Early returns from smaller lists indicated the tone of the market is down again. Some entered low bids on material they don't particularly want, but may get

Cleveland—The market declined another $2 based on early auto lists and continuing lack of sales. Biggest list went for $31 to $32 and others were expected to follow suit. Blast furnace grades are getting competitive with iron ore. Cleveland and Valley mills made a restricted buy of premium grades of turnings and boring for $22 from a handful of specified yards. It was the first major blast furnace buy in about six months.

St. Louis—One of the large district mills is out of the market on all items. Another is limiting its buying to a 10-day basis, but its prices have been above other markets, with No. 2 heavy melting up $2. Recent price cuts have slowed movement, but mill inventories are said to be heavy.

Birmingham—Major openhearth and electric furnace consumers in this district are out of the market, but some have indicated they will buy after the first of the month at lower prices. Cast is moving but orders are small.

Cincinnati—Secondary grades are drying up because of price declines and prices settled another $1 in a still slow market. Some rail grades dropped up to $4 in a lethargic market.

Buffalo—Prices declined $2 a ton across the board here on appraisal of an inactive market. No sales have been made, but the price structure is weaker in a sagging market.

Boston—For the first time in weeks, there is no downward price movement. This does not mean the market is strengthening; prices just can't move any lower. Both export and domestic demand are still off.

West Coast—Tonnages of No. 1 heavy melting have been moving in a wide range of prices in Los Angeles. Small lots have been bought from dealers at the equivalent of $39 delivered. Tonnages also have been delivered at $32. Meanwhile, scrap moved on old $39 orders. Until the market stabilizes, The IRON AGE is quoting a range of $32 to $39.

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- **Up to 16 cu. yd. open or closed containers**
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- Model CH-800M can be equipped easily to handle containers designed for other Load Lugger models.

This view at the testing site vividly portrays the tremendous size of the CH-800M and 16 cu. yd. open container.

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Jack legs in working position provide sure-footed support.

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SCRAP PRICES *(Effective Oct. 29, 1957)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$32.00 to $34.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 dealer bundles	33.00 to 34.00
No. 1 factory bundles	34.00 to 35.00
No. 2 bundles	29.00 to 30.00
No. 1 busheling	33.00 to 34.00
Machine shop turn.	17.00 to 18.00
Mixed bor. and mc. turn.	17.00 to 18.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	21.00 to 22.00
Low phos. punch'gs plate	34.00 to 35.00
Heavy turnings	32.00 to 33.00
No. 1 RR hvy. melting	34.00 to 35.00
Scrap rails, random lgth.	50.00 to 51.00
Rails 2 ft and under	57.00 to 58.00
RR steel wheels	50.00 to 51.00
RR spring steel	50.00 to 51.00
RR couplers and knuckles	50.00 to 51.00
No. 1 machinery cast	50.00 to 51.00
Cupola cast	41.00 to 42.00
Heavy breakable cast.	39.00 to 40.00

Chicago

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	32.00 to 33.00
No. 1 factory bundles	37.00 to 38.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	32.00 to 33.00
Machine shop turn.	17.00 to 18.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Low phos. forge crops	45.00 to 46.00
Low phos. punch'gs plate	41.00 to 42.00
Low phos. 3 ft and under	40.00 to 41.00
No. 1 RR hvy. melting	39.00 to 40.00
Scrap rails, random lgth	43.00 to 44.00
Rerolling rails	46.00 to 47.00
Rails 2 ft and under	45.00 to 46.00
Locomotive tires cut	45.00 to 46.00
Cut boilers & side frames	45.00 to 46.00
Angles and splice bars	47.00 to 48.00
RR steel car axles	49.00 to 50.00
RR couplers and knuckles	44.00 to 45.00
No. 1 machinery cast	41.00 to 42.00
Cupola cast	36.00 to 37.00
Heavy breakable cast.	34.00 to 35.00
Cast iron brake shoe	36.00 to 37.00
Cast iron wheels	43.00 to 44.00
Malleable	49.00 to 50.00
Stove plate	34.00 to 35.00
Steel car wheels	47.00 to 48.00

Philadelphia Area

No. 1 hvy. melting	$35.50 to $36.50
No. 2 hvy. melting	32.50 to 33.50
No. 1 dealer bundles	37.50 to 38.50
No. 2 bundles	26.50 to 27.50
No. 1 busheling	37.50 to 38.50
Machine shop turn.	21.00 to 22.00
Mixed bor. short turn.	22.00 to 23.00
Cast iron borings	23.00 to 24.00
Shoveling turnings	24.00 to 25.00
Clean cast. chem. borings	33.00 to 34.00
Low phos. 5 ft and under	44.00 to 45.00
Low phos. 2 ft and under	45.00 to 46.00
Low phos. punch'gs	45.00 to 46.00
Elec. furnace bundles	40.00 to 41.00
Heavy turnings	32.00 to 33.00
RR steel wheels	53.00 to 54.00
RR spring steel	53.00 to 54.00
Rails 18 in. and under	68.00 to 69.00
Cupola cast	40.00 to 41.00
Heavy breakable cast	40.00 to 41.00
Cast iron car wheels	48.00 to 49.00
Malleable	58.00 to 59.00
Unstripped motor blocks	32.00 to 33.00
No. 1 machinery cast	50.00 to 51.00

Cleveland

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 dealer bundles	29.00 to 30.00
No. 1 factory bundles	32.50 to 33.50
No. 2 bundles	21.00 to 22.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Cut struct'l & plates, 2 ft & under	36.00 to 37.00
Drop forge flashings	29.00 to 30.00
Low phos. punch'gs, plate	30.00 to 31.00
Foundry steel, 2 ft & under	33.00 to 34.00
No. 1 RR heavy melting	34.00 to 35.00
Rails 2 ft and under	56.00 to 57.00
Rails 18 in. and under	57.00 to 58.00
Railroad grate bars	16.00 to 17.00
Steel axle turnings	17.00 to 18.00
Railroad cast	43.00 to 44.00
No. 1 machinery cast	46.00 to 47.00
Stove plate	41.00 to 42.00
Malleable	54.00 to 55.00

Youngstown

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	32.00 to 33.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Low phos. plate	33.00 to 34.00

Buffalo

No. 1 hvy. melting	$32.00 to $33.00
No. 2 hvy. melting	29.50 to 30.50
No. 1 busheling	32.00 to 33.00
No. 1 dealer bundles	32.00 to 33.00
No. 2 bundles	26.50 to 27.50
Machine shop turn.	16.00 to 17.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	18.00 to 19.00
Low phos. plate	38.00 to 39.00
Scrap rails, random lgth.	44.00 to 45.00
Rails 2 ft and under	54.00 to 55.00
RR steel wheels	41.00 to 42.00
RR spring steel	37.00 to 38.00
RR couplers and knucklers	37.00 to 38.00
No. 1 machinery cast	44.00 to 45.00
No. 1 cupola cast	39.00 to 40.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$22.00 to $23.00
No. 2 hvy. melting	19.00 to 20.00
No. 1 dealer bundles	22.00 to 23.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	21.00 to 22.00
Drop forge flashings	21.00 to 22.00
Machine shop turn.	8.00 to 9.00
Mixed bor. and turn.	10.00 to 11.00
Shoveling turnings	10.00 to 11.00
Cast iron borings	10.00 to 11.00
Low phos. punch'gs plate	22.00 to 23.00
No. 1 cupola cast	31.00 to 32.00
Heavy breakable cast	27.00 to 28.00
Stove plate	27.00 to 28.00
Automotive cast	34.00 to 35.00

St. Louis

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	38.00 to 39.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	16.00 to 17.00
Cast iron borings	17.00 to 18.00
Shoveling turnings	18.00 to 19.00
No. 1 RR heavy melting	38.00 to 39.00
Rails, random lengths	45.00 to 46.00
Rails, 18 in. and under	55.00 to 56.00
Locomotive tires uncut	54.00 to 55.00
Angles and splice bars	45.00 to 46.00
Std. steel car axles	47.00 to 48.00
RR specialties	45.00 to 46.00
Cupola cast	43.00 to 44.00
Heavy breakable cast	36.00 to 37.00
Cast iron brake shoes	38.00 to 39.00
Stove plate	36.00 to 37.00
Cast iron car wheels	35.00 to 36.00
Rerolling rails	53.00 to 54.00
Unstripped motor blocks	36.00 to 37.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$26.00 to $27.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 dealer bundles	26.00 to 27.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	26.00 to 27.00
Elec. furnace, 3 ft & under	37.00 to 38.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and short turn.	10.00 to 11.00
Shoveling turnings	11.00 to 12.00
Clean cast. chem. borings	19.00 to 20.00
No. 1 machinery cast	34.00 to 35.00
Mixed cupola cast	29.00 to 30.00
Heavy breakable cast	30.00 to 31.00
Stove plate	26.00 to 27.00
Unstripped motor blocks	29.00 to 30.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	26.00 to 27.00
No. 2 dealer bundles	19.00 to 20.00
Machine shop turn.	11.00 to 12.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Clean cast. chem. borings	28.00 to 29.00
No. 1 machinery cast	37.00 to 38.00
Mixed yard cast	32.00 to 33.00
Charging box cast	33.00 to 34.00
Heavy breakable cast	33.00 to 34.00
Unstripped motor blocks	30.00 to 31.00

Birmingham

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	34.00 to 35.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	34.00 to 35.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	19.00 to 20.00
Electric furnace bundles	38.00 to 39.00
Elec. furnace, 3 ft & under	36.00 to 37.00
Bar crops and plate	39.00 to 40.00
Structural and plate, 2 ft	39.00 to 40.00
No. 1 RR hvy. melting	37.00 to 38.00
Scrap rails, random lgth.	45.00 to 46.00
Rails, 18 in. and under	50.00 to 51.00
Angles & splice bars	43.00 to 44.00
Rerolling rails	55.00 to 56.00
No. 1 cupola cast	47.00 to 48.00
Stove plate	47.00 to 48.00
Charging box cast	25.00 to 26.00
Cast iron car wheels	38.00 to 39.00
Unstripped motor blocks	36.00 to 37.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	18.00 to 19.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	18.00 to 19.00
Low phos., 18 in. and under	41.00 to 42.00
Rails, random length	49.00 to 50.00
Rails, 18 in. and under	57.00 to 58.00
No. 1 cupola cast	35.00 to 36.00
Hvy. breakable cast	32.00 to 33.00
Drop broken cast	47.00 to 48.00

San Francisco

No. 1 hvy. melting	$39.00
No. 2 hvy. melting	37.00
No. 1 dealer bundles	38.00
No. 2 bundles	30.00
Machine shop turn.	16.00
Cast iron borings	16.00
No. 1 RR hvy. melting	39.00
No. 1 cupola cast	$47.00 to 49.00

Los Angeles

No. 1 hvy. melting	$32.00 to $29.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	$28.00 to 29.00
No. 2 bundles	20.00 to 21.00
Machine shop turn.	10.00
Shoveling turnings	14.00
Cast iron borings	14.00
Elec. furn. 1 ft and under (foundry)	43.00
No. 1 RR hvy. melting	34.00
No. 1 cupola cast	45.00 to 46.00

Seattle

No. 1 hvy. melting	$38.00
No. 2 hvy. melting	36.00
No. 2 bundles	29.00 to 30.00
No. 1 cupola cast	38.00
Mixed yard cast	38.00

Hamilton, Ont.

No. 1 hvy. melting	$37.00
No. 2 hvy. melting	32.00
No. 1 dealer bundles	37.00
No. 2 bundles	27.00
Mixed steel scrap	32.00
Busheling	27.00
Bush., new fact., prep'd	37.00
Bush., new fact., unprep'd	31.00
Machine shop turn.	19.00
Short steel turn.	22.00
Mixed bor. and turn.	20.00
Rails, rerolling	46.00
Cast scrap	49.00


Leaders in Iron & Steel Scrap Since 1889
For over half a century our experience, personnel, equipment and key office locations have contributed to the steady growth of the iron and steel industry. Possibly our facilities may help you solve a problem in iron or steel scrap—no matter how big or small.
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NONFERROUS MARKETS

Brass Mills Report More New Orders

Mills say business has picked up in the last few weeks, but disagree on the outlook.

Copper producers are optimistic, say consumer inventory cutting is about over.

▪ A spot check of brass mills indicates business has picked up during the last couple of weeks, but there is still plenty of room for improvement.

Here's what representatives from some of the mills in the Waterbury area, both large and small, have to say:

"There has been a distinct pickup in orders in the last three to four weeks."

"We are not down in the mouth about the business we are now getting."

"October is turning out to be our best month in the last year and one half."

"I detect a much more optimistic attitude around here lately."

What's Ahead?—But beyond the fact that buying has picked up at least a little for just about everyone the picture is cloudy. One mill says the manner of improvement is just too spotty to indicate that better times are here to stay for awhile. Another points out that while October orders are definitely up over September, it is no more than had been expected. November business is expected to top October by so little as to be negligible.

On the other side of the fence, the top man in a big mill freely forecasts that a "substantial buying move by auto companies before long" will tighten the market. This executive told his supervisory staff information from Detroit was that current auto company stocks of copper and brass total only about 15 days. "Most of their copper inventories," he said, "are on the tailgates of our trucks."

Producers Prospects—Top executives of two of the Big Three copper producers were also waxing optimistic. Roy H. Glover, chairman of the board, Anaconda Co., dedicating a new mine in Chile, said the adjustment period following an over-buildup of consumer inventories, caused by uncertain market conditions, is coming to a close.

Mr. Glover figures that domestic consumption of copper in the first eight months of 1957 actually tops U. S. production plus imports by about 142,000 tons. But 20 pct of the copper used came from consumer inventories.

In a letter to stockholders, C. R. Cox, president of Kennecott Copper Co., says: "Domestic demand, which had lagged, has shown some improvement, and we remain confident it will improve further."

Lead and Zinc

It now looks like there will be some verbal fireworks at the U. S. Tariff Commission hearings concerning additional support for domestic zinc and lead producers.

A producers' representative indicated his group would definitely press for some sort of import system when the testimony opens on Nov. 19.

Against a Quota—This is sure to be met with some emphatic resistance from a coalition of importers, consumers, and representatives from countries which would be affected.

In the initial plea for an investigation by the Tariff Commission Charles E. Schwab, Emergency Lead-Zinc Committee (of U. S. producers) said that his group wanted a higher tariff, and would seek a quota on imports at a later date. Speculation at the time was that the producers would concentrate on the tariff boost first to the exclusion of a quota because consumers and importers indicated that in such a case they would only put up token resistance.

No Score Card—Exactly how the battle lines will be drawn is difficult to tell at this time. The Tariff Commission does not make public a list of witnesses until the morning of the opening session. And even this is tentative, because anyone showing up at the hearings is entitled to be heard.

Best bet is that Charles E. Schwab will call the plays for the producers.

Tin prices for the week: Oct. 23—91.25; Oct. 24—91.125; Oct. 25—91.25; Oct. 28—91.25; Oct. 29—91.375.*

*Estimate.

Primary Prices

(cents per lb)	Current price	last price	date of change
Aluminum pig	26.00	25.00	8/1/57
Aluminum ingot	28.10	27.10	8/1/57
Copper (E)	27.00	26.50	9/3/57
Copper (CS)	25.50	26.00	10/15/57
Copper (L)	27.00	26.50	9/3/57
Lead, St. L.	13.30	13.80	10/14/57
Lead, N. Y.	13.50	14.00	10/14/57
Magnesium ingot	36.00	34.09	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	74.00	64.50	12/6/56
Titanium sponge	185-250	185-225	5/8/57
Zinc, E. St. L.	10.00	10.50	7/1/57
Zinc, N. Y.	10.50	11.00	7/1/57

ALUMINUM: 99% ingot frt allwd. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig. Velasco, Tex. NICKEL: Port Colbourne, Canada. ZINC: prime western. TIN: see above; other primary prices, pg. 106.

Complete choice...Immediate delivery

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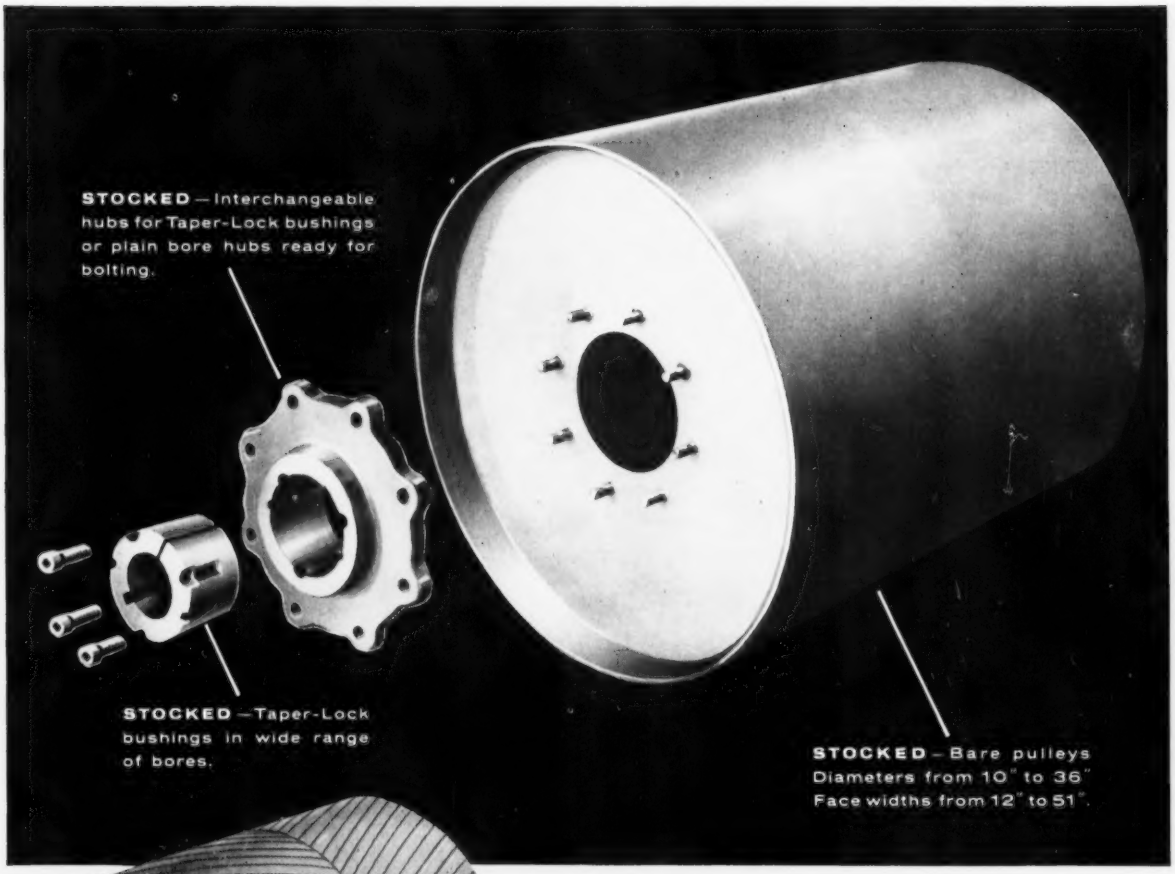
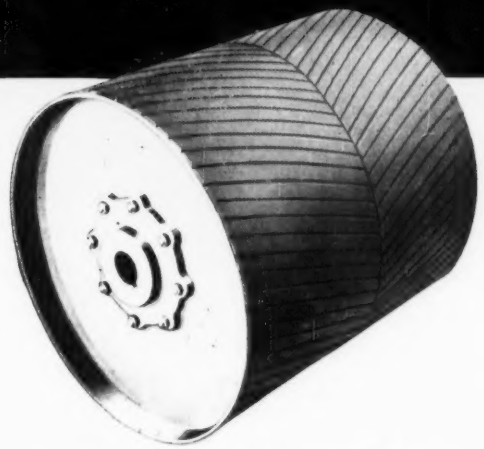
crown rolled welded steel pulleys





Jeffrey steel pulleys can be furnished with various types of rubber lagging... chevron type is shown above.

For complete details on all types of steel, cast iron and slatted pulleys, write for Catalog 928. The Jeffrey Manufacturing Company, 925 North Fourth Street, Columbus 16, Ohio.

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NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate
("F" temper except 6061-0)

Alloy	.032	.081	.136-.249	.250-.3
1100, 3003	46.6	44.3	43.6	42.7
5052	54.0	48.9	47.2	45.4
6061-0	51.4	47.0	45.2	45.1

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	45.0-46.8	60.4-64.1
12-14	45.7-47.2	61.3-65.8
24-26	49.0-49.5	72.1-76.8
36-38	58.0-58.6	96.2-99.8

Screw Machine Stock—2011-T-3

Size*	¼	⅜-⅝	¾-1	1¼-1½
Price	63.0	62.5	61.0	58.6

Roofing Sheet, Corrugated
(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.420	$1.893	$2.367	$2.839
.024 gage	1.774	2.366	2.957	3.549

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250-3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	108.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor →	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks	....	87	....

COPPER, BRASS, BRONZE

(Freight included on 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	49.13	.....	46.36	49.32
Brass, 70/30	43.02	43.56	44.26	45.93
Brass, Low	45.50	46.04	45.44	48.31
Brass, R.L.	46.37	46.91	46.31	49.18
Brass, Naval	47.27	.....	41.58	50.68
Muntz Metal	45.39	.....	41.20	.....
Comm. Bz.	47.78	48.32	47.72	50.34
Mang. Bz.	51.01	.....	45.11	.....
Phos. Bz. 5%	68.07	.....	68.57	.....

Free Cutting Brass Rod 31.30

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $9.50-$10.60; alloy, $14.75; Plate, HR, commercially pure, $8.00-$8.75; alloy, $10.75. Wire, rolled and/or drawn, commercially pure, $7.50-$8.00; alloy $10.00; Bar, HR or forged, commercially pure, $6.15-$6.40; alloy, $6.15-$6.35; billets, HR, commercially pure, $6.00-$6.25; alloy, $6.00-$6.20.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Antimony, American, Laredo, Tex... 33.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb cont'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium del'd ..... $ 1.70
Calcium, 99.9%, small lots ..... $ 4.55
Chromium, 99.8% metallic basis ... $ 1.31
Cobalt, 97-99% (per lb) ... $2.00 to $2.07
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 39.50 to 53.50
Gold, U. S. Treas., per troy oz. $35.00
Indium, 99.9%, dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz. ... $86 to $89
Lithium, 98% ..... $11.00 to $14.00
Magnesium, sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $230 to $233
Nickel oxide sinter at Copper Cliff, Ont., contained nickel 71.25
Palladium, dollars per troy oz... $23 to $24
Platinum, dollars per troy oz... $82 to $87
Rhodium ..... $120.00 to $125.00
Silver ingots (¢ per troy oz.) 90.625
Thorium, per kg. $43.00
Uranium, normal per kg. $40.00
Vanadium ..... $ 3.45
Zirconium sponge $10.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 26.75
No. 120 ..... 25.75
No. 123 ..... 24.25
80-10-10 ingot
No. 305 ..... 30.75
No. 315 ..... 28.75
88-10-2 ingot
No. 210 ..... 38.25
No. 215 ..... 34.00
No. 245 ..... 30.25
Yellow ingot
No. 405 ..... 22.00
Manganese bronze
No. 421 ..... 24.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 25.25-26.00
0.60 copper max. 25.00-25.75
Piston alloys (No. 122 type)..24.25-25.00
No. 12 alum (No. 2 grade) ...22.00-23.00
108 alloy 22.25-23.00
195 alloy 25.25-26.75
13 alloy (0.60 copper max.) ...25.00-25.75
AXS-679 ..... 22.25-23.00

(Effective Oct. 28, 1957)

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½% 23.00-24.00
Grade 2—92-95% 21.75-22.50
Grade 3—90-92% 20.50-21.50
Grade 4—85-90% 18.25-19.25

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	23	22¼
Yellow brass	17⅝	15⅝
Red brass	20¼	19½
Comm. bronze	21	20¼
Mang. bronze	16⅛	15⅜
Yellow brass rod ends	17⅛	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire ..... 21 —21½
No. 2 copper wire ..... 19½—19⅝
Light copper ..... 17¼—17½
*Refinery brass ..... 18¾—19
Copper bearing material ..... 18¼—18½
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire ..... 21 —21½
No. 2 copper wire ..... 19½—19⅝
Light copper ..... 17¼—17½
No. 1 composition 19
No. 1 comp. turnings 18½
Hvy. yellow brass solids 13
Brass pipe 15¼
Radiators 15

Aluminum

Mixed old cast. ..... 13 —14
Mixed new clips ..... 15½—16½
Mixed turnings, dry ..... 13½—14½

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 18½—19
No. 2 copper wire ..... 16½—17
Light copper ..... 15 —15½
Auto radiators (unsweated).. 11¾—12
No. 1 composition ..... 15½—16
No. 1 composition turnings... 15 —15½
Cocks and faucets ..... 12 —12½
Clean heavy yellow brass.... 11 —11½
Brass pipe ..... 12½—13
New soft brass clippings .... 13 —13½
No. 1 brass rod turnings .... 11¼—11¾

Aluminum

Alum. pistons and struts .... 5½— 6
Aluminum crankcases ..... 10½—11
1100 (2S) aluminum clippings 14 —14½
Old sheet and utensils ..... 10½—11
Borings and turnings ..... 6½— 7
Industrial castings ..... 10½—11
2024 (24S) clippings ..... 12 —12½

Zinc

New zinc clippings ..... 4 — 4½
Old zinc ..... 3 — 3½
Zinc routings ..... 1¾— 2
Old die cast scrap ..... 1½— 1¾

Nickel and Monel

Pure nickel clippings 50-55
Clean nickel turnings 45-50
Nickel anodes 50-55
Nickel rod ends 50-55
New Monel clippings 33-35
Clean Monel turnings 22-25
Old sheet Monel 30-32
Nickel silver clippings, mixed. 20
Nickel silver turnings, mixed. 17

Lead

Soft scrap lead ..... 8½— 9
Battery plates (dry) ..... 4 — 4¼
Batteries, acid free ..... 2¾— 3

Miscellaneous

Block tin ..... 75 —76
No. 1 pewter ..... 59 —60
Auto babbitt ..... 39 —40
Mixed common babbitt ..... 11 —11¼
Solder joints ..... 15 —15½
Siphon tops 42
Small foundry type ..... 12½—12¾
Monotype ..... 12½—12¾
Lino. and stereotype ..... 11½—11¾
Electrotype ..... 10½—10¾
Hand picked type shells ..... 7½— 8
Lino. and stereo. dross ..... 3½— 3¾
Electro dross ..... 2¾— 3

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$114.00 *B3*		5.325 *B3*	7.80 *B3*	5.325 *B3*						
	Buffalo, N. Y.	$77.50 *R3, B3*	$96.00 *R3, B3*	$114.00 *R3, B3*	6.225 *B3*	5.325 *B3*	7.80 *B3*	5.325 *B3*	4.925 *R3, B3*	7.15 *S10*	7.325 *B3*			
	Phila., Pa.									7.70 *P15*				
	Harrison, N. J.													15.05 *C11*
	Conshohocken, Pa.		$101.00 *A2*	$121.00 *A2*					4.975 *A2*	7.20 *A2*	7.325 *A2*			
	New Bedford, Mass.									7.60 *R6*				
	Johnstown, Pa.	$77.50 *B3*	$96.00 *B3*	$114.00 *B3*		5.325 *B3*	7.80 *B3*							
	Boston, Mass.									7.70 *T8*				15.40 *T8*
	New Haven, Conn.									7.60 *D1*				
	Baltimore, Md.									7.15 *T8*				
	Phoenixville, Pa.					5.325 *P2*		5.325 *P2*						
	Sparrows Pt., Md.								4.925 *B3*		7.325 *B3*			
	Bridgeport, Wallingford, Conn.	$80.50 *N8*	$101.00 *N8*	$114.00 *N8*						7.60 *W1*				
	Pawtucket, R. I. Worcester, Mass.									7.70 *N7* 7.70 *A5*				15.40 *N7* 15.20 *T8*
MIDDLE WEST	Alton, Ill.								5.125 *L1*					
	Ashland, Ky.								4.925 *A7*					
	Canton-Massillon, Dover, Ohio		$96.00 *R3*	$114.00 *R3, T5*						7.15 *G4*		10.45 *G4*		14.85 *C11*
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	$77.50 *U1, R3*	$96.00 *U1, R3,W8*	$114.00 *U1, R3,W8*	6.225 *U1*	5.275 *U1, W8 P13*	7.75 *U1,Y1 W8*	5.275 *U1*	4.925 *W8, N4,A1*	7.25 *A1,T8 M8*			8.10 *W8, S9,I3*	15.05 *A1, S9,G4*
	Cleveland, Ohio									7.15 *A5,J3*		10.45 *A5*	8.10 *J3*	
	Detroit, Mich.			$114.00 *R3*					5.025 *G3, M2*	7.25 *M2,D1, D2,G3,P11*	7.425 *G3*	10.60 *D2* 10.55 *G3*	8.10 *G3*	
	Anderson, Ind.									7.15 *G4*				
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$77.50 *U1*	$96.00 *U1*	$114.00 *U1, Y1*		5.275 *U1, I3*	7.75 *U1, I3*	5.525 *I3*	4.925 *U1, I3,Y1*	7.15 *Y1*	7.325 *U1, I3,Y1*	10.60 *Y1*	8.10 *U1, Y1*	
	Sterling, Ill.	$77.50 *N4*				5.275 *N4*			5.025 *N4*					
	Indianapolis, Ind.									7.30 *J3*				15.20 *J3*
	Newport, Ky.												8.10 *A9*	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		$96.00 *S1, C10*	$114.00 *C10,S1*					4.925 *R3, S1*	7.15 *R3,T4 S1*	7.325 *R3, S1*	10.50 *S1* 10.45 *R3*	8.10 *S1*	15.05 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Aliquippa, Pa.	$77.50 *U1, P6*	$96.00 *U1, C11,P6*	$114.00 *U1, C11,B7*	6.225 *U1*	5.275 *U1, J3*	7.75 *U1, J3*	5.275 *U1*	4.925 *P6*	7.15 *J3,B4, S7*			8.10 *S9*	15.05 *S9*
	Weirton, Wheeling, Follansbee, W. Va.					5.275 *W3*			4.925 *W3*	7.15 *W3,F3*	7.325 *W3*	10.50 *W3*		
	Youngstown, Ohio	$77.50 *R3*	$96.00 *Y1, C10*	$114.00 *Y1*			7.75 *Y1*			7.15 *Y1,J3*	7.325 *U1, Y1*	10.65 *Y1*	8.10 *U1, Y1*	15.05 *J3* 10.65 *Y1*
WEST	Fontana, Cal.	$88.00 *K1*	$105.50 *K1*	$135.00 *K1*		6.075 *K1*	8.55 *K1*	6.225 *K1*	5.825 *K1*	9.00 *K1*				
	Geneva Utah		$96.00 *C7*			5.275 *C7*	7.75 *C7*							
	Kansas City, Mo.					5.375 *S2*	7.85 *S2*						8.35 *S2*	
	Los Angeles, Torrance, Cal.		$105.50 *B2*	$134.00 *B2*		5.975 *C7, B2*	8.45 *B2*		5.675 *C7, B2*	9.05 *J3*			9.30 *B2*	17.25 *J3*
	Minnequa, Colo.					5.575 *C6*			6.025 *C6*	9.10 *K1*				
	Portland, Ore.					6.025 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$105.50 *B2*			5.925 *B2*	8.40 *B2*		5.675 *C7, B2*					
	Seattle, Wash.		$109.50 *B2*			6.025 *B2*	8.50 *B2*		5.925 *B2*					
SOUTH	Atlanta, Ga.					5.475 *A8*			5.125 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$77.50 *T2*	$96.00 *T2*			5.275 *T2, R3,C16*	7.75 *T2*		4.925 *T2, R3,C16*		7.325 *T2*			
	Houston, Lone Star, Texas		$101.00 *S2*	$119.00 *S2*		5.375 *S2*	7.85 *S2*						8.35 *S2*	

(Effective Oct. 28, 1957)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL PRICES

		SHEETS								WIRE ROD	TINPLATE†		BLACK PLATE
		Hot rolled 18 ga. & hvyr.	Cold rolled	Galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* 1.25 lb. base box	Electro* 0.25 lb. base box	Holloware Enameling 29 ga.
EAST	Bethlehem, Pa.												
	Buffalo, N. Y.	4.925 *B3*	6.05 *B3*				7.275 *B3*	8.975 *B3*		6.15 *W6*	† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25c. ELECTRO: 0.50-lb. add 25c; 0.75-lb. add 65c; 1.00-lb. add $1.00. Differential 1.00 lb. 0.25 lb. add 65c.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	4.975 *A2*	6.10 *A2*				7.325 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.15 *B3*			
	Fairless, Pa.	4.975 *U1*	6.10 *U1*				7.325 *U1*	9.025 *U1*			$10.15 *U1*	$8.85 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	4.925 *B3*	6.05 *B3*	6.60 *B3*			7.275 *B3*	8.975 *B3*	9.725 *B3*	6.25 *B3*	$10.15 *B3*	$8.85 *B3*	
	Worcester, Mass.									6.45 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.35 *L1*			
	Ashland, Ky	4.925 *A7*		6.60 *A7*	6.625 *A7*								
	Canton-Massillon, Dover, Ohio			6.60 *R3, R1*									
	Chicago, Joliet, Ill.	4.925 *W8, A1*					7.275 *U1*			6.15 *A5, R3,W8, N4,K2*			
	Sterling, Ill.									6.25 *N4,K2*			
	Cleveland, Ohio	4.925 *R3, J3*	6.05 *R3, J3*		6.625 *R3*		7.275 *R3, J3*	8.975 *R3, J3*		6.15 *A5*			
	Detroit, Mich.	5.025 *G3, M2*	6.15 *G3* 6.05 *M2*				7.375 *G3*	9.075 *G3*					
	Newport, Ky	4.925 *A1*	6.05 *A1*										
	Gary, Ind. Harbor, Indiana	4.925 *U1, I3,Y1*	6.05 *U1, I3,Y1*	6.60 *U1, I3*	6.625 *U1, I3,Y1*	7.00 *U1*	7.275 *U1, Y1,I3*	8.975 *U1, Y1*		6.15 *Y1*	$10.05 *U1, Y1*	$8.75 *I3, U1,Y1*	7.50 *U1, Y1*
	Granite City, Ill.	5.125 *G2*	6.25 *G2*	6.80 *G2*	6.825 *G2*							$8.85 *G2*	7.60 *G2*
	Kokomo, Ind.			6.70 *C9*						6.25 *C9*			
	Mansfield, Ohio		6.05 *E2*			7.00 *E2*							
	Middletown, Ohio		6.05 *A7*	6.60 *A7*	6.625 *A7*	7.00 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	4.925 *R3, N3,S1*	6.05 *R3*	6.60 *R3*	6.625 *N3, S1*	7.00 *N3, S1,R3*	7.275 *R3*	8.975 *S1, R3*				$8.75 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Donora, Pa. Aliquippa, Pa.	4.925 *U1, J3,P6*	6.05 *U1, J3,P6*	6.60 *U1, J3*	6.625 *U1*		7.275 *U1, J3*	8.975 *U1, J3*	9.725 *U1*	6.15 *A5, J3,P6*	$10.05 *U1, J3*	$8.75 *U1, J3*	7.50 *U1, J3*
	Portsmouth, Ohio	4.925 *P7*	6.05 *P7*							6.15 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.925 *W3, W5*	6.05 *W3, F3,W5*	6.60 *W3, W5*		7.00 *W3, W5*	7.275 *W3*	8.975 *W3*			$10.05 *W5, W3*	$8.75 *W5, W3*	7.50 *W5*
	Youngstown, Ohio	4.925 *U1, Y1*	6.05 *Y1*		6.625 *Y1*		7.275 *Y1*	8.975 *Y1*		6.15 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.30 *K1*				8.175 *K1*	10.275 *K1*			$10.80 *K1*	$9.50 *K1*	
	Geneva, Utah	5.025 *C7*											
	Kansas City, Mo.									6.40 *S2*			
	Los Angeles, Torrance, Cal.									6.95 *B2*			
	Minnequa, Colo.									6.40 *C6*			
	San Francisco, Niles, Pittsburgh, Cal.	5.625 *C7*	7.00 *C7*	7.35 *C7*						6.95 *C7*	$10.80 *C7*	$9.50 *C7*	
	Seattle, Wash.												
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	4.925 *T2, R3*	6.05 *T2, R3*	6.60 *T2, R3*						6.15 *T2, R3*	$10.15 *T2*	$8.85 *T2*	
	Houston, Tex.									6.40 *S2*			

(Effective Oct. 28, 1957)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfrs'. Bright
EAST	Bethlehem, Pa.				6.475 *B3*	8.775 *B3*	7.925 *B3*					
	Buffalo, N. Y.	5.425 *R3,B3*	5.425 *R3,B3*	7.35 *B5*	6.475 *B3,R3*	8.775 *B3,B5*	7.925 *B3*	5.10 *B3*		7.20 *B3*		7.65 *W6*
	Claymont, Del.							5.70 *C4*		7.20 *C4*	7.625 *C4*	
	Coatesville, Pa.							5.10 *L4*		7.20 *L4*	7.925 *L4*	
	Conshohocken, Pa.							5.20 *A2*	6.175 *A2*	7.20 *A2*	7.625 *A2*	
	Harrisburg, Pa.							5.80 *P2*	6.275 *P2*			
	Milton, Pa.	5.575 *M7*	5.575 *M7*									
	Hartford, Conn.			7.80 *R3*		9.075 *R3*	7.925 *B3*					
	Johnstown, Pa.	5.425 *B3*	5.425 *B3*		6.475 *B3*			5.10 *B3*		7.20 *B3*	7.625 *B3*	7.65 *B3*
	Fairless, Pa.	5.575 *U1*	5.575 *U1*		6.625 *U1*							
	Newark, N. J. Camden, N. J.			7.75 *W10* 7.75 *P10*		8.95 *W10* 8.95 *P10*						
	Bridgeport, Conn. Putnam, Conn. Willimantic, Conn.	5.65 *N8*	5.65 *N8*	7.65 *N8* 7.85 *W10* 7.80 *J3*	6.55 *N8*	8.925 *N8*						
	Sparrows Pt., Md.		5.425 *B3*					5.10 *B3*		7.20 *B3*	7.625 *B3*	7.75 *B3*
	Palmer Worcester, Readville, Mass. Mansfield, Mass.			7.85 *B5,C14*		9.075 *A5,B5*						7.95 *A5, W6*
	Spring City, Pa.			7.75 *K4*		8.95 *K4*						
MIDDLE WEST	Alton, Ill.	5.625 *L1*										7.85 *L1*
	Ashland,Newport,Ky.							5.10 *A7,A1*		7.20 *A1*		
	Canton, Massillon, Ohio			7.30 *R3,R2*	6.475 *R3,T5*	8.775 *R3,R2, T5*						
	Chicago, Joliet, Waukegan, Ill. Harvey, Ill.	5.425 *U1,R3, W8,N4,P13*	5.425 *U1,R3, N4,P13*	7.30 *A5, W10,W8 B5,L2,N9*	6.475 *U1,R3, W8*	8.775 *A5, W10,W8 L2,N8,B5*	7.925 *U1,W8*	5.10 *U1,A1, W8,I3*	6.175 *U1*	7.20 *U1,W8*	7.625 *U1,W8*	7.65 *A5,R3, W8,N4, K2,W7*
	Cleveland, Ohio	5.425 *R3*	5.425 *R3*	7.30 *A5,C13*		8.775 *A5, C13*	7.925 *R3*	5.20 *R3,J3*	6.175 *J3*		7.625 *R3, J3*	7.65 *A5, C13*
	Detroit, Mich.	5.525 *G3*	5.775 *G3*	7.30 *J3* 7.50 *P8,B5*	6.475 *J3* 6.575 *G3*	8.775 *R3* 8.975 *B5,P3, P8*	8.025 *G3*	5.20 *G3*		7.35 *G3*		
	Duluth, Minn.											7.65 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.425 *U1,I3, Y1*	5.425 *U1,I3, Y1*	7.30 *R3,J3*	6.475 *U1,I3, Y1*	8.775 *R3,M4*	7.925 *U1, Y1*	5.10 *U1,I3, Y1*	6.175 *J3,I3*	7.20 *U1,Y1*	7.625 *U1, Y1,I3*	7.75 *M4*
	Granite City, Ill.							5.30 *G2*				
	Kokomo, Ind.											7.75 *C9*
	Sterling, Ill.	5.525 *N4*	5.525 *N4*					5.10 *N4*				7.75 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.30 *C10*	6.475 *C10,S1*	8.775 *C10*	7.925 *S1*	5.10 *R3,S1*		7.20 *S1*	7.625 *R3, S1*	
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.425 *U1,J3*	5.425 *U1,J3*	7.30 *A5,B4, R3,J3,C11, W10,S9,C8*	6.475 *U1,J3, C11,B7*	8.775 *A5, W10,R3,S9, C11,C8*	7.925 *U1,J3*	5.10 *U1,J3*	6.175 *U1*	7.20 *U1,J3, B7*	7.625 *U1,J3, B7*	7.65 *A5, J3,P6*
	Portsmouth, Ohio											7.65 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.10 *W5*				
	Youngstown, Ohio	5.425 *U1,R3, Y1*	5.425 *U1,R3, Y1*	7.30 *A5,Y1, F2*	6.475 *U1,Y1*	8.775 *Y1,F2*	7.925 *U1,Y1*	5.10 *U1,R3, Y1*		7.20 *Y1*	7.625 *U1, R3,Y1*	7.65 *Y1*
WEST	Emeryville, Cal.	6.175 *J5*	6.175 *J5*									
	Fontana, Cal.	6.125 *K1*	6.125 *K1*		7.525 *K1*		8.625 *K1*	5.90 *K1*		8.00 *K1*	8.425 *K1*	
	Geneva, Utah							5.10 *C7*			7.625 *C7*	
	Kansas City, Mo.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*					7.90 *S2*
	Los Angeles, Torrance, Cal.	6.125 *C7,B2*	6.125 *C7,B2*	8.75 *R3,P14*	7.525 *B2*	10.65 *P14*	8.625 *B2*					8.60 *B2*
	Minnequa, Colo.	5.875 *C6*	5.875 *C6*					5.95 *C6*				7.90 *C6*
	Portland, Ore.	6.175 *O2*	6.175 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.125 *C7* 6.175 *B2*	6.125 *C7* 6.175 *B2*				8.675 *B2*					8.60 *C7,C6*
	Seattle Wash.	6.175 *B2,N6*	6.175 *B2*				8.675 *B2*	6.00 *B2*		8.10 *B2*	8.525 *B2*	
SOUTH	Atlanta, Ga.	5.625 *A8*	5.625 *A8*									7.85 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.425 *T2,R3, C16*	5.425 *T2,R3, C16,S11*	7.90 *C16*			7.925 *T2*	5.10 *T2,R3*			7.625 *T2*	7.65 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*	5.20 *S2* 5.45 *L3*		7.30 *S2*	7.725 *S2*	7.90 *S2*

(Effective Oct. 28, 1957)

† Merchant Quality—Special Quality 35c higher.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Chaindetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh

C1 Cafstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING — **Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.**

STANDARD T. & C.	BUTTWELD ⅛ In. Blk.	⅛ In. Gal.	¼ In. Blk.	¼ In. Gal.	⅜ In. Blk.	⅜ In. Gal.	½ In. Blk.	½ In. Gal.	¾ In. Blk.	¾ In. Gal.	1 In. Blk.	1 In. Gal.	1¼-1½ In. Blk.	1¼-1½ In. Gal.	2 In. Blk.	2 In. Gal.	2½-3 In. Blk.	2½-3 In. Gal.	SEAMLESS 2 In. Blk.	2 In. Gal.	2½ In. Blk.	2½ In. Gal.	3 In. Blk.	3 In. Gal.	3½-4 In. Blk.	3½-4 In. Gal.
Sparrows Pt. *B3*											3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Youngstown *R3*											5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fontana *K1*											+8.25	+23.5	+5.25	+19.5	+1.75	+15.00	0.75	+14.25	1.25	+13.25	1.75	+12.75	3.25	+13.00								
Pittsburgh *J3*											5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Alton, Ill. *L1*											3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Sharon *M3*											5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fairless *N2*											3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Pittsburgh *N1*											5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Wheeling *W5*											5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Wheatland *W4*											5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Youngstown *Y1*											5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Indiana Harbor *Y1*											4.25	+11.0	7.25	+7.0	10.75	+2.50	13.25	+1.75	13.25	+0.75	14.25	+0.25	15.75	+1.00								
Lorain *N2*											5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
EXTRA STRONG PLAIN ENDS																												
Sparrows Pt. *B3*											7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Youngstown *R3*											9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Fairless *N2*											7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Fontana *K1*											+3.75		0.25		3.25		3.75		4.25		4.75		5.25									
Pittsburgh *J3*											9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Alton, Ill. *L1*											7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Sharon *M3*											9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Pittsburgh *N1*											9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Wheeling *W5*											9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Wheatland *W4*											9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Youngstown *Y1*											9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Indiana Harbor *Y1*											8.75	+5.0	12.75	+1.0	15.75	3.50	16.25	2.25	16.75	3.25	17.25	3.75	17.75	2.50								
Lorain *N2*											9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50

Threads only, buttweld and seamless 2½ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ⅛, ¼ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 10¢ per lb.

(Effective Oct. 28, 1957)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.74	T-1
18	4	1	—	5	2.445	T-4
18	4	2	—	—	1.905	T-2
1.5	4	1.5	8	—	1.10	M-1
6	4	3	6	—	1.49	M-3
6	4	2	5	—	1.245	M-2
High-carbon chromium					.925	D-3, D-5
Oil hardened manganese					.475	O-2
Special carbon					.36	W-1
Extra carbon					.36	W-1
Regular carbon					.305	W-1

Warehouse prices on and east of Mississippi are 3c per lb higher. West of Mississippi, 6c higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

Stainless Type	Cladding	Plate (*A3, J2, L4*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
	302				37.50
	304	37.95	42.25	46.70	40.00
	316	44.40	49.50	54.50	58.75
	321	40.05	44.60	49.30	47.25
	347	42.40	47.55	52.80	57.00
	405	29.85	33.35	36.85	
	410	29.55	33.10	36.70	
	430	29.80	33.55	37.25	

CR Strip (*S9*) Copper, 10 pct, 2 sides, 40.25; 1 side, 33.95.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.525	6.50	6.975				
Cleveland *R8*							14.75
So. Chicago *R8*				9.75			
Ensley *T2*	5.525	6.50					
Fairfield *T2*		6.50		9.75		6.60	
Gary *U1*	5.525					6.60	
Huntington *C16*		6.50					
Ind. Harbor *I5*	5.525		6.975	9.75		6.60	
Ind. Harbor *Y1*				9.75			
Johnstown *B8*		6.50					
Joliet *U1*			5.975				
Kansas City *S2*				9.75			14.75
Lackawanna *B8*	5.525	6.50	6.975			6.60	
Lebanon *B8*			6.975		14.50		14.75
Minnequa *C6*	5.525	7.00	6.975	9.75		6.60	14.75
Pittsburgh *P5*							14.75
Pittsburgh *J8*				9.75			
Seattle *B2*				10.25		6.75	15.75
Steelton *B8*	5.525		6.975			6.60	
Struthers *Y1*				9.75			
Torrance *C7*						6.75	
Williamsport *S8*		6.50					
Youngstown *R8*				9.75			

COKE

	Net-Ton
Furnace, beehive (f.o.b.) Connellsville, Pa.	$15.00 to $15.75
Foundry, beehive (f.o.b.)	$17.50 to $19.00
Foundry oven coke	
Buffalo, del'd	$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville Is., Pa.	29.25

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1957 season. Freight charges for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field		9.625	
Armature	11.10	10.85	11.35
Elect.	11.80	11.55	12.05
Hermetic		12.10	
Motor	12.90	12.65	13.15
Dynamo	13.95	13.70	14.20
Trans. 72	15.00	14.75	15.25
Trans. 65	15.55		
		Grain Oriented	
Trans. 58	16.05	Trans. 80	19.20
Trans. 52	17.10	Trans. 73	19.70

Producing points: Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I8*); Mansfield (*E2*); Newport, Ky. (*N3*); Niles, O. (*N6*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	26.00	40	100, 110	10.70
20	72	25.25	35	110	10.70
18	72	25.75	30	110	10.85
14	72	25.75	24	72 to 84	11.25
12	72	26.25	20	90	11.00
10	60	28.00	17	72	11.40
10	48	28.50	14	72	11.85
7	60	28.25	12	60	12.95
6	60	31.50	10	60	13.00
4	40	35.00	8	60	13.30
3	40	37.00			
2½	30	39.25			
2	24	60.75			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$135.00
No. 1 Ohio	120.00
Sec. Quality, Pa., Md., Ky., Mo., Ill.	120.00
No. 2 Ohio	103.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00)	21.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$150.00
Childs, Hays, Pa.	155.00
Chicago District	160.00
Western Utah	175.00
California	180.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	157.00-160.00
Silica cement, net ton, bulk, Latrobe	28.50
Silica cement, net ton, bulk, Chicago	25.50
Silica cement, net ton, bulk, Ensley, Ala.	26.50
Silica cement, net ton, bulk, Mt. Union	24.50
Silica cement, net ton, bulk, Utah and Calif.	37.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$105.00
Standard chemically bonded, Curtner, Calif.	115.00
Burned, Balt.	99.00

Magnesite Brick

Standard Baltimore	$131.00
Chemically bonded, Baltimore	116.00

Grain Magnesite

St. ⅜ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk	$72.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in:	
Pa., W. Va., Ohio	$16.75
Midwest	17.00
Missouri Valley	15.00

(Effective Oct. 28, 1957)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢ lb.	Merch. Wire Galv. ¢ lb.
Alabama City *R8*	173	187		212	193	8.65	9.20
Aliquippa *J5***	173	190			190	8.65	9.325
Atlanta *A8***	175			208	199	8.50	9.10
Bartonsville *K2***	175	192	178	214	198	8.75	9.425**
Buffalo *W6*						8.65	8.95*
Chicago *N4****							
Cleveland *A6*							
Cleveland *A5*						8.65	
Crawf'dav. *M4***	175	192		214	198	8.75	9.425
Donora, Pa. *A5*	173	187		212	193	8.65	9.20
Duluth *A5*	173	187		212	193	8.65	9.20
Fairfield, Ala. *T2*	173	187		212	193	8.65	9.20
Galveston *D4*	9.10‡						
Houston *S2*	178	192		217	198	8.90	9.45
Jacksonville *M4*	184	197		219	203	9.00	9.675
Johnstown *B5***	173	190	172		196**	8.65	9.325**
Joliet, Ill. *A5*	173	187		212	193	8.65	9.20
Kokomo *C9**	175	189		214	195*	8.75	9.30*
L. Angeles *B2****						9.60	10.275
Kansas City *S2**	178	192		217	198*	8.90	9.45*
Minnequa *C6*†	178	192	177	217	198†	8.90	9.45†
Monessen *P6*					193	8.65	9.20
Palmer, Mass. *W6*						8.95	9.50*
Pittsburg, Cal. *C7*	192	210			213	9.60	10.15
Rankin, Pa. *A5*	173	187			193	8.65	9.20
So. Chicago *R8*	173	187			193	8.65	9.20
S. San Fran. *C6*†				236		9.60	10.15†
SparrowsPt. *B5***	175			214	198	8.75	9.425
Struthers, O. *Y1**						8.65	9.30
Worcester *A5*	179					8.95	9.50
Williamsport *S8*							

* Zinc less than .10¢.
** 11-12¢ zinc.
*** .10¢ zinc.
‡ Plus zinc extras.
† Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.10	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*		10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70		
Detroit *D1*	9.05	10.50	12.70	15.70	
Detroit *D2*	9.05	10.50	12.70		
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60		
Franklin Park, Ill. *T8*	9.05	10.25	12.45	15.45	18.40
Harrison, N. J. *C11*			12.90	16.10	19.30
Indianapolis *J3*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Pittsburgh *S7*	8.95	10.40	12.60	15.60	18.55
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*		10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *J3*	8.95	10.40	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
National Tube	2	13	36.34	42.56	35.22
	2½	12	48.94	57.31	47.43
	3	12	56.51	66.18	54.77
	3½	11	65.97	77.25	63.93
	4	10	87.61	102.59	85.53
Pittsburgh Steel	2	13	36.34	42.56	
	2½	12	48.94	57.31	
	3	12	56.51	66.18	
	3½	11	65.97	77.25	
	4	10	87.61	102.59	

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
½" and smaller x 6" and shorter	49	54	56	57
⅝" thru 1" x longer than 6"	35	40	43	45
Rolled thread carriage bolts ½" & smaller x 6" and shorter	49	54	56	57
Lag, all diam. x 6" & shorter	49	54	56	57
Lag, all diam. longer than 6 in.	39	44½	47	48½
Plow bolts, ½" and smaller x 6" and shorter	49	54	56	57

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	60½
⅞ in. to 1 in. inclusive	55½
1⅛ in. to 1½ in. inclusive	58½
1⅝ in. and larger	53½
C. P. Hex, reg. & hvy.	
¾ in. and smaller	60½
⅞ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½
Hot Galv. Hex Nuts (All Types)	
¾ in. and smaller	46½
Semi-finished Hex Nuts	
⅝ in. or smaller	60½
¾ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½

(Add 25 pct for broken case or keg quantities)

Finished

⅞ in. and smaller 63

Rivets

Base per 100 lb

½ in. and larger $12.25

Pct. Off List

7/16 in. and smaller 19

Cap Screws

Discount (Packages)

	Full Finished H. C. Heat Treat	*C-1018 Steel Full-Finished Cartons Bulk*
New std. hex head, packaged ⅜" diam. and smaller x 6" and shorter	40	26
½", ⅝", and 1" diam. x 6" and shorter	22	3
⅜" diam. and smaller x longer than 6"	8	+13
½", ⅝", and 1" diam. x longer than 6"	+ 6	+32
⅜" through ⅝" dia. x 6" and shorter	58	49
¾" through 1" dia. x 6" and shorter	45	33

Minimum quantity ¼" through ⅝" diam., 15,000 pieces; 1 1/16" through 6⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

Plain Finish		Discount Mach. Screws	Stove Bolts
Cartons		19	32
Bulk	*Quantity*		
To ¼" diam. incl.	25,000-200,000	9	54
5/16 to ½" diam. incl.	25,000-200,000	9	54
All diam. over 3" long	5,000-100,000	—	54

Machine Screws & Stove Bolt Nuts

		Discount Hex	Square
In Cartons		16	19
In Bulk	*Quantity*		
⅜" diam & smaller	15,000-100,000	7	9

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.5
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 4 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	45.00
Electrodeposited	36.25
Brass, 80-20, ball anodes, 2000 lb or more	44.00
Zinc, ball anodes, 2000 lb lots	17.50
(for elliptical add 1¢ per lb)	
Nickel, 99 pct plus, rolled carbon, 5000 lb	102.25
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.70

Tin, ball anodes and elliptical $1.13 per lb.

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	73.20
Copper sulphate, 100 lb bags, per cwt.	24.35
Nickel salts, single, 100 lb bags	40.50
Nickel chloride, freight allowed, 300 lb	45.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	23.05
(Philadelphia price 23.30)	
Zinc cyanide, 100 lb	59.00
Potassium cyanide, 100 lb drum N. Y.	48.00
Chromic acid, flake type, 10,000 lb or more	31.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh

Swedish sponge iron, del. East of Miss. River, ocean bags, 23,000 lb. and over	10.5¢
F.O.B. Riverton or Camden, New Jersey, freight allowed west of Miss. River	9.5¢
Domestic sponge iron, 98+% Fe, 23,000 lb. and over del'd East of Miss. River	10.5¢
F.O.B. Riverton, New Jersey, West of Miss. River	9.5¢
Canadian sponge iron, del'd in East, carloads	12.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	22.0¢
Carbonyl iron size 3 to 20 micron, 98%, 99.8+% Fe	88.0¢ to $2.85
Aluminum, freight allowed	38.00¢
Brass, 10 ton lots	31.1¢ to 47.1¢
Copper, electrolytic	41.5¢
Copper, reduced	40.3¢ to 48.8¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99.85% min. Fe. 03 max. Del'd	$5.00
Lead	21.50¢ lb, f.o.b. plant
Manganese f.o.b. Extron, Pa.	46.0¢
Molybdenum, 99%	$3.60 to $3.95
Nickel, chemically precipitated	$1.05
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed 2ES9	$1.13
Silicon	43.50¢
Solder powder	13¢ plus met. value
Stainless steel, 302	$1.02
Stainless steel, 316	$1.30
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$3.75 (nominal)
Zinc, 5000 lb & over	17.5¢ to 30.7¢

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery† Charge	Sheets: Hot-Rolled 18 ga. & hvr.	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled merchant	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.64	8.97	9.05	9.01	10.68				
Baltimore	$.10	8.38	8.88	9.71	8.86	8.76	9.29	9.16	11.44*	16.18	15.18	19.73	18.98
Birmingham	.15	8.18	9.45	10.15	8.23	8.56	8.64	8.60	10.57				
Boston	.10	9.48	10.54	11.55	9.52	9.82	9.73	9.83	13.00	15.79	15.38	19.89	19.18
Buffalo	.15	8.40	9.15	11.22	8.65	9.05	9.05	8.95	11.05*	16.34	15.15	19.01	18.95
Chicago	.15	8.35	9.60	10.15	8.38	8.71	8.79	8.75	8.95	15.80	14.80	19.35	18.60
Cincinnati	.15	8.49	9.65	10.20	8.69	9.08	9.33	9.07	9.46	15.61	15.11	18.96	18.91
Cleveland	.15	8.33	9.60	10.10	8.48	8.94	9.16	8.84	10.95	15.89	14.89	19.44	18.96
Denver	.20	9.70	11.30	12.49	9.80	9.70	9.80	9.98	10.65				17.60
Detroit	.15	8.58	9.85	10.50	8.73	9.06	9.33	9.05	9.30	15.46	15.06	18.81	18.86
Houston		8.45	9.75		8.60	9.05	9.10	9.05	11.10	16.20		19.30	19.05
Kansas City	.20	9.02	10.27	10.07	9.05	9.38	9.46	9.42	9.87	20.02	15.47	20.02	19.27
Los Angeles	.10	9.60	10.85	11.75	9.65	9.65	9.20	9.65	12.85	17.25	16.10	21.05	19.25
Memphis	.15	8.02	9.22		8.12	8.35	8.39	8.25	9.85				
Milwaukee	.15	8.48	9.73	10.28	8.51	8.84	9.00	8.88	9.18	15.43	14.93	18.78	18.73
New York	.10	8.97	10.23	10.66	9.41	9.53	9.45	9.67	12.86*	15.02	15.19	18.42	18.99
Norfolk	.20	8.00			8.40	8.35	8.70	8.45	10.70				
Philadelphia	.10	8.10	9.00	9.97	8.79	8.87	8.60	8.75	11.61	15.61	15.11	18.96	18.91
Pittsburgh	.15	8.33	9.60	10.50	8.48	8.71	8.79	8.75	10.95*	15.80	14.80	19.35	18.60
Portland		9.50	11.20	11.55	11.35	8.30	9.65	9.65	14.65	18.50	16.10	20.75	20.25
San Francisco	.10	9.45	10.85	11.10	9.55	9.70	9.60	9.80	13.10	17.05	16.10	21.05	20.35
Seattle		9.95	11.15	12.00	10.00	9.70	9.80	10.80	14.05	16.55	16.35	20.65	20.15
Spokane	.15	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.20		17.35	21.55	21.05
St. Louis	.15	8.69	9.94	10.51	8.74	9.08	9.25	9.12	9.56	15.66	15.16	19.01	18.96
St. Paul	.15	8.94	10.19	10.76	8.99	9.45	9.53	9.37	9.81		15.26		19.06

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other or with galvanized sheets for quantity.

†† 10¢ zinc. † Deduct for country delivery. †3/16 in. to ½ in. * C1018—1 in. rounds.

(Effective Oct. 28, 1957)

PIG IRON

Dollars per gross ton, .o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	.....
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	.....
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	66.50	67.00	67.50	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50	.....	.....
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Sharpsville *S3*	66.00	66.50	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	.....	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	.....
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	74.00
Youngstown *Y1*	.....	.....	66.50	67.00	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.); $64.00. Add $1.00 premium for all grades silvery to 18 pct.

*) Intermediate low phos.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	27.00	28.00	31.50	32.00	33.25	49.50	40.00	46.50	—	21.50	—	21.75
Billets, forging	—	36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	32.00	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	37.75	33.75	34.25	34.25
Plates	44.25	45.00	46.25	47.25	50.00	50.75	76.75	59.75	69.75	40.25	35.00	36.75	36.00
Sheets	48.50	49.25	51.25	52.00	—	55.50	81.50	65.50	79.25	48.25	40.25	—	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	—	55.50	81.50	65.50	79.25	48.25	40.25	—	40.75
Wire CF; Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.25	52.50 52.75	61.50	35.75	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J2*, Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Harrison, N. J., *D3*; Youngstown, *J3*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (plus further conversion extras); *W1*; New Bedford, Mass. (.25¢ per lb higher), *R6*; Gary, *U1* (.25¢ per lb higher).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*, Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa. *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*, S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*, *R3*; Ft. Wayne, *I4*; Detroit, *R3*; Gary, *U1*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*, Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.
Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown; *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R3*; Munhall, Pa., S. Chicago, *U1*.

(Effective Oct. 28, 1957)

FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C	41.00	0.50% C	38.00
0.05% C	39.00	1.00% C	37.75
0.10% C	38.50	1.50% C	37.50
0.20% C	38.25	2.00% C	37.25

4.00-4.50% C, 66-70% Cr, 1-2% Si.. 28.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 27.50
0.02% C (Simplex) 36.75
8.00% max C, 60-65% Cr, 3-6% max Si 25.00
8.50% max C, 60-65% Cr, 3% max Si 25.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe

0.10% max. C	$1.31
0.50% max. C	1.31
9 to 11% C, 88-91% Cr, 0.75% Fe...	1.40

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	$1.29
Ton lots	1.31
Less ton lots	1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.

Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads	27.50	14.20
Ton lots	32.75	15.65
Less ton lots	34.35	17.30

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-32% Ca, 60-65% Si, 3.00 max. Fe.

Carloads	25.65
Ton lots	27.95
Less ton lots	29.45

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	24.25
Ton lots	26.15
Less ton lots	27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	21.15
Less ton lots	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 8-11% Mn, packed

Carload lots	17.20
Ton lots	18.70
Less ton lots	19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%

Carload packed	18.50
Ton lots to carload packed	19.65
Less ton lots	20.90

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

	Cents per-lb
Producing Point	
Marietta, Ashtabula, O., Alloy, W. Va., Sheffield, Ala., Portland, Ore.	12.25
Johnstown, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25

Add or substract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	14.80
Ton lots packed	17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	34.00
Ton lots	36.00
250 to 1999 lb	38.00
Premium for Hydrogen - removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.20% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60

0.75% max. C, 80.85% Mn, 5.0-7.0% Si ... 28.60 31.40 32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk	12.80
Ton lots, packed	14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	15.10
Ton lots, packed, pallets	16.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots, packed	Carloads, packed
96.75% Si, 1.25% Fe..	24.20	22.90
98% Si, 0.75% Fe	24.95	23.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk	7.70
Ton lots, packed	10.50

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	13.00	75% Si....	16.40
65% Si....	15.25	85% Si....	18.10
	90% Si....	19.50	

Ferrovanadium

50-55% V delivered, per pound, contained V, carloads, packed.

Openhearth	3.20
Crucible	3.30
High speed steel (Primos)	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.95	$2.95	$3.75
Less ton lots..	2.40	3.30	4.55

(Effective Oct. 28, 1957)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.65¢
Ton lots	11.80¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.28

Ferrocolumbium, 50-50%, 2 in. x D, delivered per pound contained Cb.

Ton lots	$4.90
Less ton lots	4.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Sb plus Ta $4.25

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.68

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload $110.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $240.00

Ferrotungsten, ¼ x down packed, per pounds contained W, ton lots delivered ..... $2.60 (nominal)

Molybdic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa. $1.41
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 .. $1.38

Zirconium, per lb of alloy

35-40% f.o.b. freight allowed, carloads, packed	27.25¢
12-15%, del'd lump, bulk-carloads	9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B

2000 lb carload	$5.50

Bortram, f.o.b. Niagara Falls.

Ton lots per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.

Ton lots per pound	14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots, F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	.85
14 to 19%	1.20
19% min. B	1.50

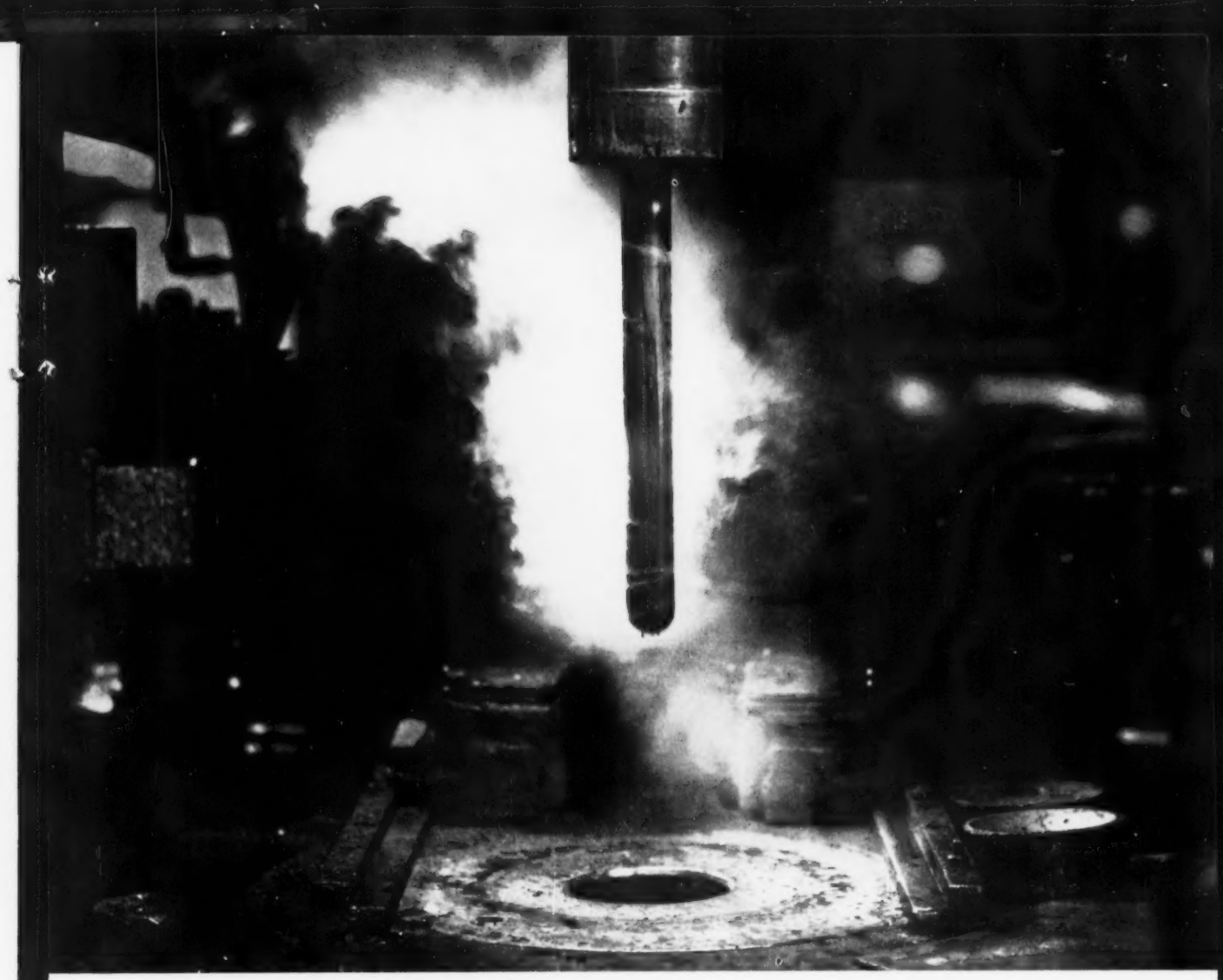
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over

No. 1	$1.05
No. 79	50¢

Manganese-Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots	$1.46
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15



Tough 2½" diameter mandrel at Rc 44 on 1150 ton brass extrusion press. Scovill Manufacturing Co.

Mandrel of HALCOMB 218 retains toughness and hardness at hot work temperatures...

This mandrel is made of Halcomb 218—a tough, air-hardening hot work steel. Halcomb 218 is suitable for tools like this which require a higher degree of toughness at moderately elevated temperatures than is obtainable with the tungsten types of hot work steels. And Halcomb 218 *retains both* its hardness and strength at these temperatures.

For example, at a hardness of Rc 44, Halcomb 218's Charpy Impact Strength is 33 ft-lbs at 500F. And it will retain this hardness after 1 hour, after 10 hours and even after 100 hours at temperatures up to 900F.

Properties like these cut tooling costs. The mandrel shown above is good for 1200 pushes, for example, and even then all it needs, usually, is repolishing before being used again.

Halcomb 218 is particularly useful for all hot work operations on which drastic coolants are used. It even resists breaking very successfully when water cooled in operation. If these sound like advantages you can use, call your local Crucible representative for more complete data. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

Canadian Distributor—Railway & Power Engineering Corp., Ltd.

Exporters Facing Sales Battle

Used machinery dealers selling in Europe find the competition is getting rougher.

With lower labor costs, foreign manufacturers can sell their new units at prices equal to those of 5-year-old U.S. tools.

▪ Outlook for used machinery export business is looking increasingly grim through 1958 according to one of the leading firms in the business—Laurens Bros. of Cincinnati. Reasons are:

European economy generally is starting to slow down in a reflection of the U. S. pattern.

German and French machine tool makers are back in business in a big way. Their lower labor rates enable them to turn out a new machine for the price of a 4-to-5-year-old U. S. counterpart.

European builders are heavily engaged in foreign manufacturing or licensing to take advantage of the labor rate and can sell new units cheaper than used U. S. types.

Because of trade balances, many foreign countries must prove the machine is unobtainable in a country where there is favorable credit before they can buy a U. S. machine.

U. S. Engineering Helps—On the latter point it would seem there's little relation between oranges from Italy and German machine tools. Yet Italian oranges are shipped in huge quantities into Germany, piling up German cash credits in Italy. A German manufacturer seeking a special machine is strongly urged to buy in Italy.

Exporting firms in the U. S. therefore are finding their best market abroad in expensive, highly specialized machines. The market in Europe does not justify the cost of engineering and developing them so there has been little emphasis on them by foreign makers. However, a firm like Laurens, for instance, which does 70 pct of its volume in export, specializes in high production machines already developed and in use here. And the freight costs are a lesser increment.

Out From the Seaway—Foreign car makers now doing a good export business are sticking to new machine tools like their American counterparts. These are largely of German and English design where machine tool makers have kept pace with the industry because of a lucrative market.

Shipments to Europe are regularly being made now via the St. Lawrence Seaway through the ports of Detroit, Toledo and Cleveland. Because of the shortness of the season, volume is not expected to spiral. But additional freight savings and greater number of sailings are sure to be a help when the Seaway opens in 1959.

Cincinnati Market Better — In the domestic market in Cincinnati there has been a mild upturn after a slow summer. New business is coming in generally across the board, rather than from any one industry. One missing segment is the new man going into business for himself. This trend fell off during the summer and no revival is seen.

CONSIDER GOOD USED EQUIPMENT FIRST

BENDING ROLLS
10' x 10 Ga. Bertsch Initial Type
10' x ½" Kling Pyramid Type
12' x ½" Hilles & Jones Pyramid Type
10' x ¾" Ransome Pyramid Type

BRAKES—LEAF TYPE
12' x ¼" Dreis & Krump
12' x ⅜" Dreis & Krump

BRAKE—PRESS TYPE
12' x ½" Cincinnati

CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton P&H	60' Span	220-3-60
5 ton Cleveland	60' Span	115 Volt D.C.
5 ton P&H	64' Span	220-3-60
10 ton Shepard Niles	58' Span	440-3-60
10 ton Shaw	120' Span	230 Volt D.C.
15 ton Shepard Niles	72' Span	220 Volt D.C.
15 ton Shepard Niles	65' Span	220-440 A.C.
15 ton Niles	75' Span	220-3-60
20 ton P&H	55' Span	220-440 A.C.
20 ton McM&M	72' Span	230 Volt D.C.
With two 10 ton Trolleys		
120 ton Shepard Niles	77' Span	220/3-60

CRANE—LADLE
#2 Alliance Lr. & 40 Ton Capacity, 60' Span, Motors 220 Volt D.C.

CUT OFF MACHINE
#2A Modern Automatic Cut Off Machine For Pipe, Tubing, Bars to 2" O.D.

DIEING MACHINE
150 ton Henry & Wright, 3" Stroke, Roll Feed Scrap Cutter, 20 H.P. A.C. Motor

FORGING MACHINES
1" to 5" Acme, Ajax, National

HAMMERS—BOARD DROP—STEAM DROP—STEAM FORGING
800 lb. to 20,000 lb. incl.

HEADERS
#250 Manville Solid Die Single Stroke
#14 Waterbury Farrel 1880's, 0 4/0, ⅞" x 6"

LEVELLERS—ROLLER
18" Torrington, 15 Rolls 2⅝" dia.
37" Torrington, 19 Rolls 1.31.32" dia.
66" Aetna 17 Rolls 1⅜" dia.

PLANER
72" x 72" x 16' Detrick & Harvey Four Head

PLANER—PLATE EDGE
35' Southwark 16 Pheu. Jacks, Capy. 1½"

PRESSES—HYDRAULIC
500 ton H&M Fastraverse, Bed 36"x36"
1500 ton Bliss, Lr. Stroke, Bed 40"x48"
1,000 ton Mesta Steam Hydr. Forging Press
2000 ton Bliss 18" Stroke Bed Area 54"x55"
4500 Baldwin-Lima-Hamilton Hydr. Forging Press

PRESSES—STRAIGHT SIDE
100 ton Clearing F1100, 11" Str. Bed 30 x 36"
180 ton Hamilton #847, 12" Str. 8½" Bet. Ups
200 ton Clearing #1200-42, Stroke 5⅝", Bed 44"x38"
240 ton Bliss #88 12" Str. Bed 29" x 20"
250 ton Bliss 81 7½" Str. Bed 33" x 39"

PRESSES—KNUCKLE JOINT
600 ton Clearing K-1600-36, 4" stroke, Bed 36" x 36"
1500 ton Verson, 4" Stroke, Bed 48 x48", Architectural size

PUNCH & SHEAR COMBINATIONS
Cleveland Style E-5, Arch Jaw 0 4/0, 1¼" x 1"
Cleveland Style G Single End, 60" Throat
Cleveland Style W, 60" Throat
#2 King, 72" Throat, With Thomas Duplicator

ROLLING MILLS
6" x 5" Torrington Wire Flattening Mill Line
8" x 10" Schmitz Singl. Stand Two High
10" x 14" Single Stand Two High
10" x 16" Single Stand Two High
12" x 12" Single Stand Two High
12" x 16" Single Stand Two High
16" x 30" Farrel Two Stand Two High
20" x 56" Single Stand Two High

ROLL—PLATE STRAIGHTENING
72" Niles, 7 Rolls 9" Dia. Motor Driven

SHEAR—ALLIGATOR
No. 4 Mesta RH-LK, Capacity 2" x 12"

SHEARS—GATE
6' x 1" Hilles & Jones #6
12" x ⅜" Niagara Model 1212, NEW 1951

SHEAR LINES
36" x .020 Ga. Hallden Shear Line
53" x ⅜" Heavy Duty Shear Line
60 x 7 Ga. Shear Line
96" x 14 Ga. Cleveland Shear Line

SHEARS—SQUARING
6' x 10 Ga. Niagara No. 672
10' x ¼" Cincinnati #1810
10' x ⅝" Cincinnati #2510

SHEARS—ANGLE
6 x 6 x ⅝ Hilles & Jones
4 x 4 x ⅝" Long & Allistatter

SLITTERS
24" Yoder Slitting Line
36" Paxon Slitting Line

STRAIGHTENERS
No. 3 Medart 3 Roll, Capacity to 4½" Tubing
Kane & Roach Roll Straightener & Cut-off, Capacities 2 7/16" to ⅝" Hex Bars

SWAGING MACHINES
#1 Fenn, Capacity 2¼" Tubing, LATE
#6½A Fenn, Capacity 3¾" Tube, 1¼" Solid, 16" Die Length Hydraulic Feed, LATE

WIRE MACHINERY
New England Butt Co. 4 Bobbin Planetary cablers Model X-30A, Bobbin Size 16" x 19½"

Manufacturing

A. T. HENRY & COMPANY, INC.

50 CHURCH ST., NEW YORK CITY 8
Telephone COrtlandt 7-3437

Equipment

Confidential Certified Appraisals
Liquidations—Bona Fide Auction Sales Arranged

Consulting Engineering Service
Surplus Mfg. Equipment Inventories Purchased

RE-NU-BILT
GUARANTEED
ELECTRIC POWER EQUIPMENT
DC MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	3900	Elliott		475	720
1	2250	Elliott		600	200/300
1	2200	G.E.	MCF	600	400/500
1	1750	Elliott		250	175/350
1	1375	G.E.	MCF	415	1300
1	1200	G.E.	MCF	600	150/600
1	940	Whse.	QM	250	140/170
3	800	G.E.	MCF	250	400/750
1	450	Whse.		550	415
2	300	G.E.	MPC	230	400
2	200	Whse.	CR-207-4	250	850/1200
2	125	Whse.	SK-190	230	450/1200
1	150	G.E.	CDBB	600	250/700
1	150	Cr. Wh.	65-H	230	1150
1	125	Whse.	SK-185	230	350/1050
1	125	Whse.	SK-183	230	850
2	100	Whse.	SK-181	230	450/1000
1	60/100	G.E.	RF-17	230	450/900
1	75	G.E.	CD-1231	230	850
2	75	Cr. Wh.	5BTEFC	230	860
1	50	G.E.	MD-412-AE	230	550
6	40	Rel-BB	3SFTEFC	230	500/1500
2	30/40	Whse D.P.	SK-131.5-BB	230	500/1500
3	(unused) 30	G.E.	CDM-85-BB	230	2200

MG SETS—3 Ph. 60 Cy.

Qu.	K.W.	Make	RPM	DC Volts	AC Volts
2	2000/2400	G.E.	450	250/300	2300/4600
1	2000	G.E.	514	600	2300/4600
2	1750/2100	G.E.	514	250/300	2300/4600
2	1000	G.E.	720	600	600/2300
1	750	G.E.	720	125/250	2300/4600
1	500	Whse.	800	125/250	440
1	500	G.E.	900	125/250	440/2300
2	300	G.E.	1200	250	2300
1	300	Whse.	1200	275	440/2300
1	250	Whse.	1200	275	2300
1	200	El. Ma.	1200	250	2300/4600
1	200	Whse.	1200	550	2300
1	200	G.E.	1200	250	440

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
3	2033	Whse.	OISC	1	13800 x 2300
1	2000	A.C.	OISC	3	23000 x 2300
1	1500	G.E. auto	BT	3	4600/4200/4100
3	1000	G.E.	HVDDJ	1	2400 x 480
3	1000	G.E.	OA/FA	1	13800 x 220/460
1	833	G.E.	H	1	13800 x 460
2	750	G.E.	Pyranol	1	4800 x 83/55
3	500	Kuhl	OISC	1	13200 x 6600
3	500	Kuhl		1	4800/2400 x 240/480
1	500	G.E.	BT	3	4160 x 480/277
3	200	Al. Ch.	OISC	1	2300 x 230/460
3	150	G.E.		1	22000 x 2300/1000Y

BELYEA COMPANY, INC.
47 Howell Street, Jersey City 6, N. J.

2000# Chambersburg Pneumatic Forging Hammer, Late Type, Serial 20CH392L7.
4000 lb. Chambersburg Double Frame Steam Forg. Hammer
2500 lb. Erie Single Leg Steam Forg. Hammer
Bliss Trimmina Presses Tie Rod Construction Side Shears Capacities 113, 150, 190 tons
United Engineering & Fdry. Alligator Shear Clutch operated; Cap. 6½" Sq.
3—2-ton Denison Auto. Hopper Feed & Index Table Hydr. Multipress
2500 lb. Model E Chambersburg Steam Drop Hammer, New 1944
6' x 10 ga. Cincinnati Squaring Shear
¼" x 8' Pexto Gate Shear; 20" throat
4" National High Duty Upsetting & Forging Machine, air clutch, also one with regular clutch, also 1", 2", 3"
Williams White Bulldozers from 5-ton to 300-ton
Landis Landmaco and other Landis Threading Machines
Single & Double End Punches
No. 3 Motch & Merryweather Saw, with Saw Grinder
No. 3 Waterbury Farrel Progressive Header, Cap. ½"; 4 stations and 1 Cutoff

BOLT, NUT AND RIVET MACHINERY, COLD HEADERS, THREAD ROLLERS, THREADING MACHINES, TAPPERS, COLD BOLT TRIMMERS, SLOTTERS, HOT HEADERS AND TRIMMERS, COLD AND HOT PUNCH NUT MACHINES.

DONAHUE STEEL PRODUCTS CO.
1919 W. 74th Street, Chicago 36, Ill.

REBUILT—GUARANTEED ELECTRICAL EQUIPMENT
SLIP RING MOTORS
Constant Duty—3 phase, 60 cycle

Qu.	H.P.	Make	Type	Volts	R.P.M.
2	2500	Whse.	CW	1600/2300	720
1	2500	G.E.	Mill	2300	240
1	1800	Whse.	Mill	6600/1000	270
2	1800	Whse.	Mill	2200	252
2	500	Al. Ch.	ARY	2300	585
1	500	G.E.	I-M	2200	450
1	100	Al. Ch.	ARY	2200	585
1	100	Whse.	CW	2200	290
1	350	G.E.	I-M-15B	2200	1180
1	350	G.E.	MT-412	2200	450
1	300	Whse.	CW-1012	2200	720
1	250	Al. Ch.	ARY	440	585
1	250	G.E.	MT-414	2200	300
1	200	G.E.	I-M	2200	1760
2	200	G.E.	I-17-M	2200	585
1	200	G.E.	I-11-M	2200	900
1	150	Al. Ch.	ARY	440/220	720
1	150	Whse.	CW	1160/2300	585
1	150	Whse.	CW-1000	440	435
1	100	Whse.	CW	440/220	1160
1	100	El. Dy.	EDX612	2300	900
2	100	G.E.	MT-562	440/220	570
2	100	G.E.	I-15A-M	2300	1800
1	100	Al. Ch.	ARY	440	720

SYNCHRONOUS MOTORS
3 Phase, 60 Cycle

Qu.	H.P.	Make	P.F.	Volts	R.P.M.
1	1750	G.E.	100	2200	3600
1	1500	G.E.	80	2400/1160	900
1	1500	Whse.	80	2300	514
1	950	G.E.	80	2200/440	360
1	710	G.E.	80	2300	720
1	450	Whse.	100	2200	128.5
3	350	G.E.	100	2300	900
1	300	G.E.	100	2300	720
1	300	G.E.	80	2200	600
2	200	G.E.	80	440	360
2	200	Whse.	80	440	600
1	200	Al. Ch.	100	2200	514
1	200	Al. Ch.	100	2300	360
1	150	G.E.	100	2200	900
1	150	El. Mchy.	80	220	720
1	150	G.E.	100	550	600
3	135	G.E.	80	1600/2200	1200
1	125	G.E.	80	2200	900
2	100	Whse.	80	440/220	1800
1	100	Ideal	80	440/220	900
2	100	G.E.	80	440/220	600
1	100	El. Mchy.	100	440/220	360
2	50	G.E.	80	2200	600

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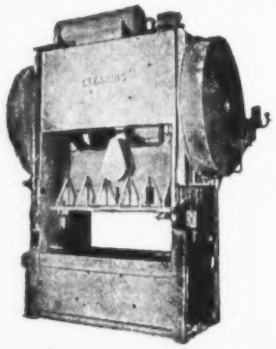

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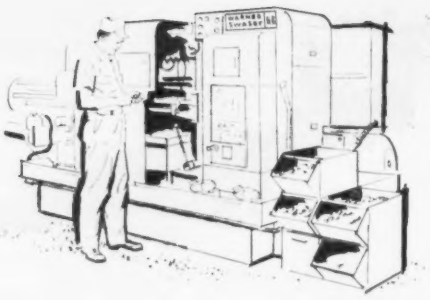
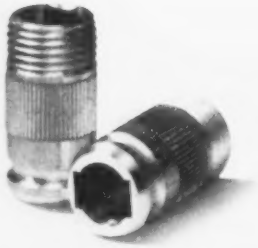
CLASSIFIED SECTION

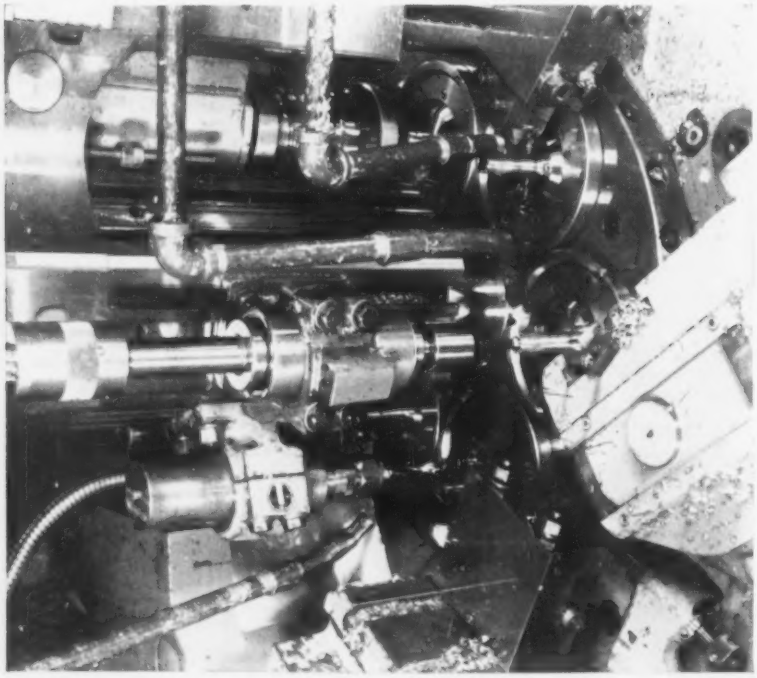
At Porter-Cable Machine Company.....



6-Spindle Automatic saves $12,700 on this one job!



A savings of over 7½¢ was realized on each of these small brass Brush Holder Bodies for electric motors when this formerly subcontracted work was handled on one of their 1¼" Warner & Swaseys.



Porter-Cable of Syracuse, N. Y., veteran producer of wood-working tools and powered garden equipment, reports through their Chief Manufacturing Engineer, Charles Allen: *"Our two Warner & Swasey 6-Spindle quick setup Automatics have an important place in our cost-reduction program. They consistently turn out the highly accurate parts our products require, saving us money on jobs that run in lot sizes from a few hundred to many thousand pieces."*

Here's what Warner & Swasey 6-Spindle Automatics did for Porter-Cable Company:

- **ACCURACY**—Tolerances of plus or minus .001" easily held, maintaining high product quality.
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- **FAST SETUP—SMALL LOTS**—Jobs previously run on hand screw machines now more efficiently handled on the Automatics.
- **VERSATILITY**—Machining of tougher materials, parts with threads at each end, multiple diameters, broached holes are all now routine operations.

Why not have our Field Engineers evaluate your operations with a view to highlighting jobs that could be more profitably machined on modern Warner & Swasey Multi-Spindle Automatics? He's as near as your phone—call him today!

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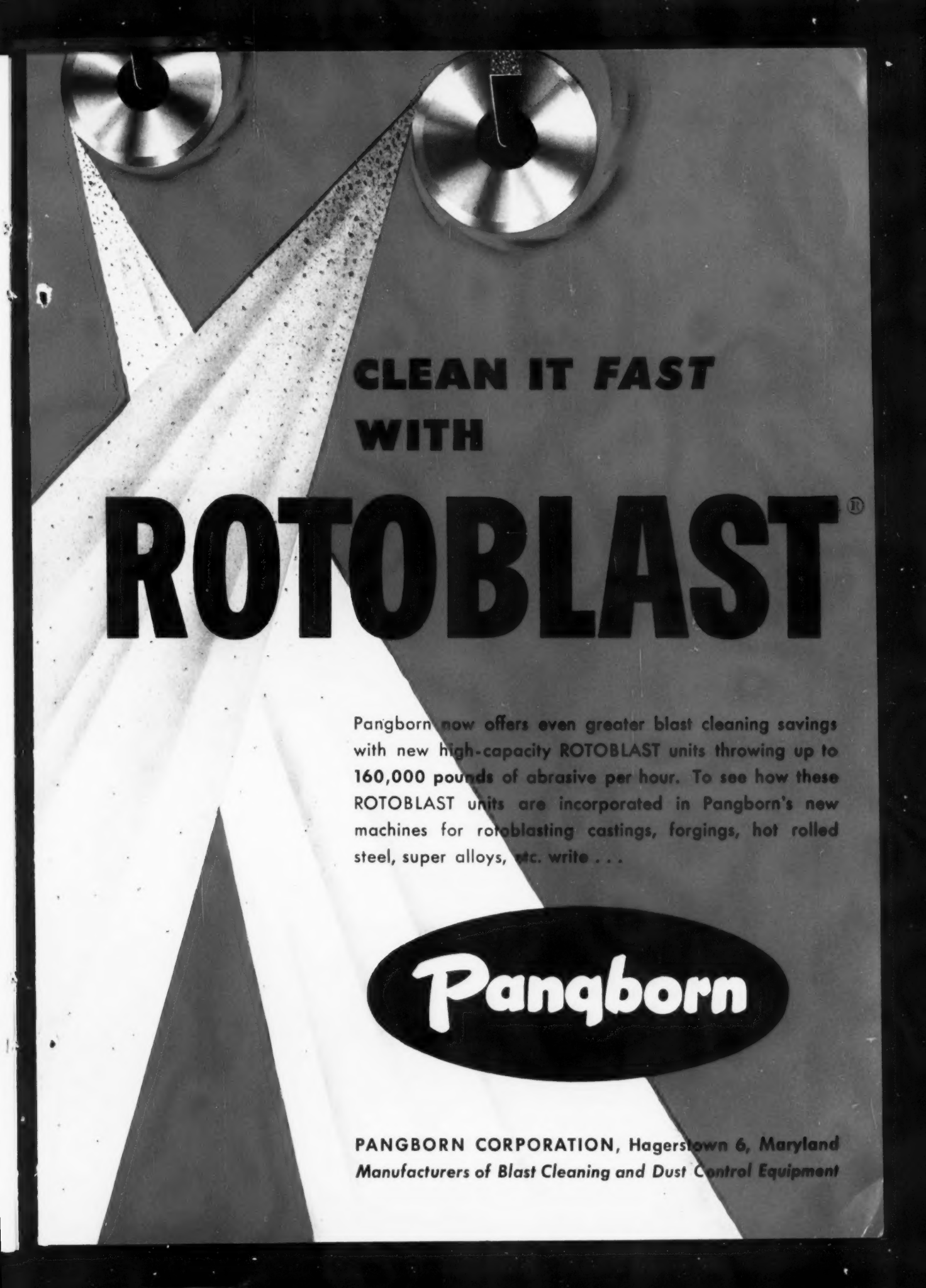
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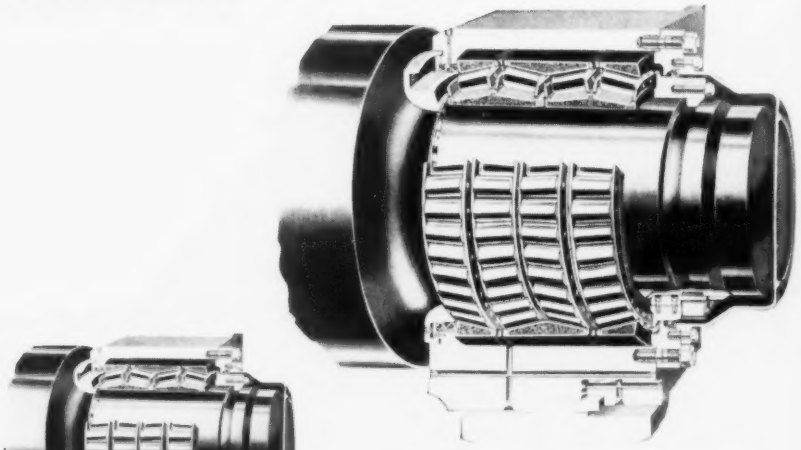
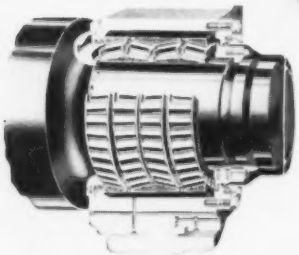
TIMKEN® bearings used on rolling mill roll necks



1957
689 mills



1950
317 mills

1933
45 mills

Look how this idea has grown in 24 years!

JUST 24 years ago—in 1933—there were 45 mills using Timken bearing-equipped stands. Today, 1,631 Timken bearing-equipped stands are used in 689 mills . . . more than fifteen times as many mills as in 1933.

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4. LOAD RATINGS INCREASED UP TO 40% due to Timken bearings' balanced proportion design.

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